

Chemical Week

January 4, 1958

Price 35 cents



Tax cut from the new Congress?
Not likely. Defense, antirecession
measures come first p. 16

Chemical bomber gets go-ahead
from Air Force; CPI will be key
member of development crew . p. 17

New push for aerosol sales. Nitro-
gen propellant opens appetizing
market in food packaging . . p. 30

◀ **Pilot-plant data in a trice.** Analog
computer makes short work of
process calculations p. 42

Carbon black outlook: increasing
sales; continuing swing to furnace
blacks p. 51

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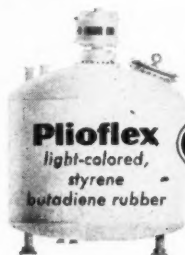
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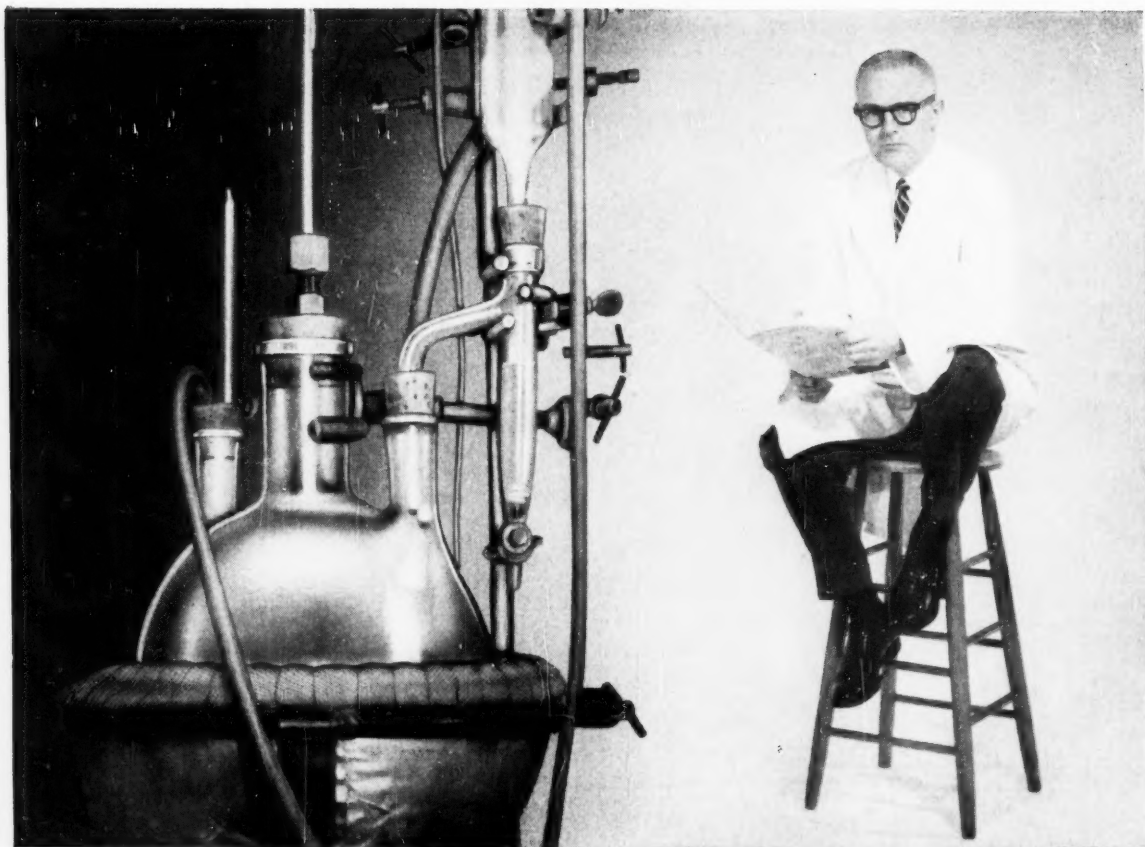


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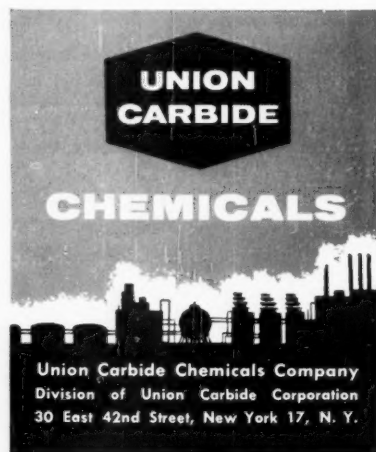
ADHESIVES—Homopolymers of 2-ethylhexyl acrylate are useful as adhesives and bonding agents.

TEXTILE FINISHES—Copolymers of vinyl acetate with higher acrylates are suggested for finishing cottons.

LUBRICATING OILS—Investigate copolymers of higher acrylates for viscosity index improvers and pour point depressants.

Applications don't stop here! A roundup of known and potential uses for the higher acrylates and ethyl acrylate, butyl acrylate and 2-ethylhexyl acrylate are described in—**ACRYLIC ESTERS** (F-7434)—For a copy write Union Carbide Chemicals Company, Department H, Room 328, 30 East 42nd Street, New York 17, New York.

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*In Canada—Carbide Chemicals Company,
Division of Union Carbide Canada Limited,
Montreal.*

TOP OF THE WEEK

- ▶ **Topics are set for chemical sessions** of International Labour Organization's February meeting in Switzerlandp. 24
- ▶ **Industry scores federal research in medicine**, fears manpower, talent waste; distrusts patents planp. 33
- ▶ **Marine paint gets tryout in CPI**—nondrying "fluid film" tested for corrosion resistance, durabilityp. 37
- ▶ **Trying to make your sales program more effective?** Try logic—Carbide is doing this in its new sales clinicp. 56

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- 17 Chemical industry shoulders responsibility for developing—on schedule—right fuels for projected 2,000-mph. jet bombers.
- 18 Twenty-one state legislatures meet this month, will grind out new laws on matters of industry concern: taxes, water supply, pollution control, labor relations.

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Atomic energy program, scientific manpower shortages are among host of topics on agenda of chemical sessions at February meeting of International Labour Organization in Switzerland.

- 25 U. S. Supreme Court ruling broadening state court jurisdiction may affect pollution suits.

30 SPECIALTIES

Nitrogen's making a big stir in the aerosol industry. Here's why it looms as key to launching of food products, and what its impact will be on aerosol business in '58.

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cern about the big federal investments in research.

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- 44 Computer center opened to provide service to chemical firms that don't yet want to invest in this equipment.

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Logic in making selling more persuasive is idea behind Carbide's new training program. Here's the firm's plan for combining personality with a well-reasoned sales approach.

- 57 Vacuum-metalized paper, polyester film make their bow in the packaging field. And more metalized plastics are on the way.

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No. 1

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Watch CW Grow — 39,583 copies of this issue printed

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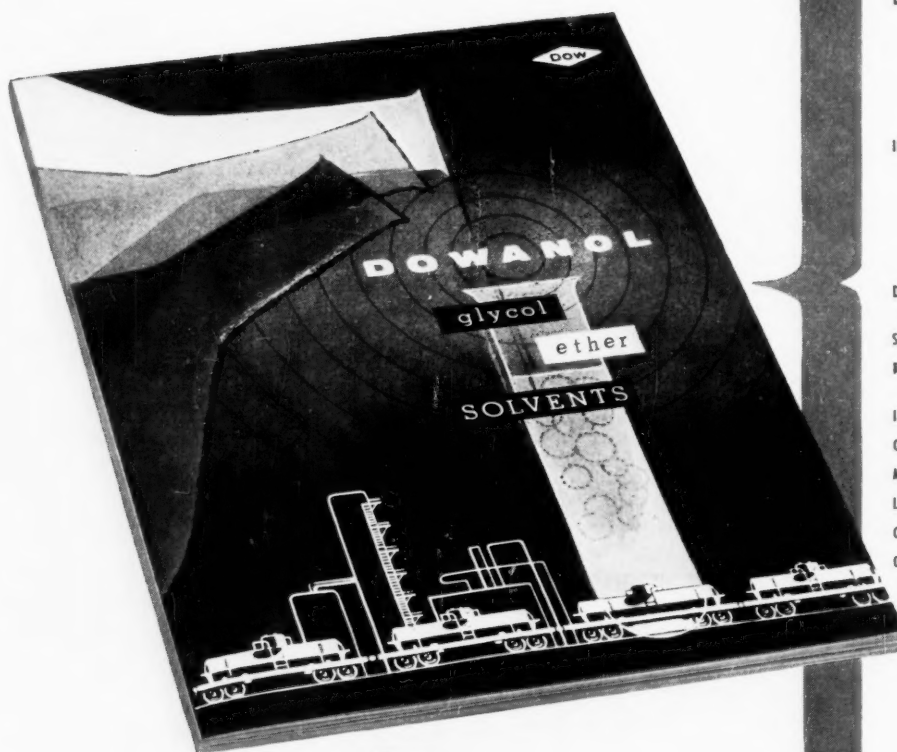


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Stamp Ink Pads
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DRY CLEANING SOAPS AND
SPOTTING FLUIDS

SOLUBLE OILS
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(PHOSPHORIC ACID TYPE)

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OTHER USES

ANALYTICAL METHODS
A—Boiling Range
B—Specific Gravity
C—Acidity
D—Color
E—Reflux Boiling Point

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1

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2

**New
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booklet**

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3

**New
production
facilities**

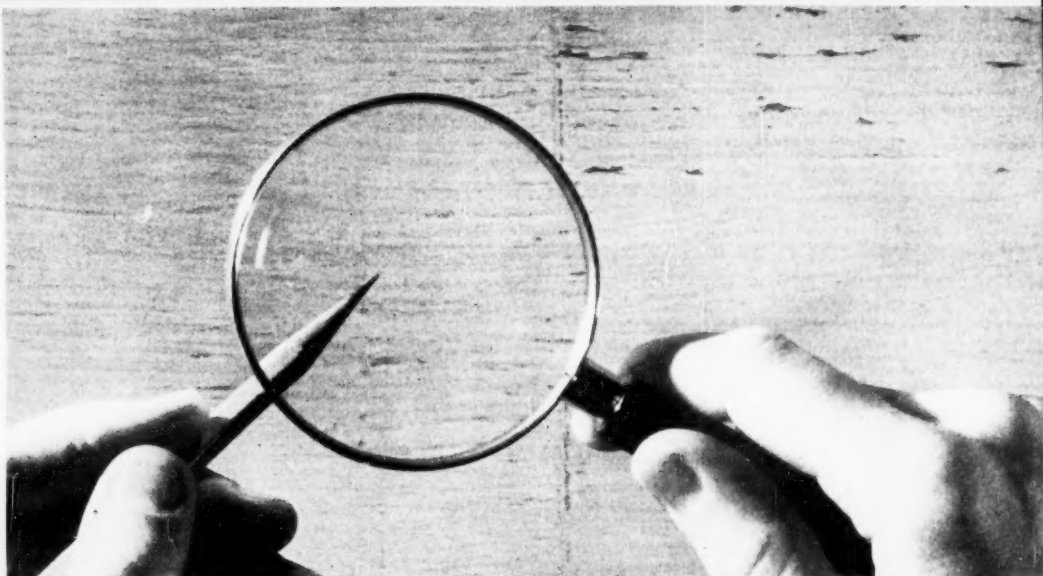
The main reason for changing the nomenclature and for publishing this booklet boils down to this: The widespread use of Dowanol products has called for more technical facts and more generally understood terminology. Widespread use has also dictated expansion. Our answer: A new plant in Midland, Michigan, which more than doubles output.

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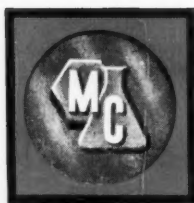
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***New Laboratory Animal Bedding
sets record in sanitation, low cost**

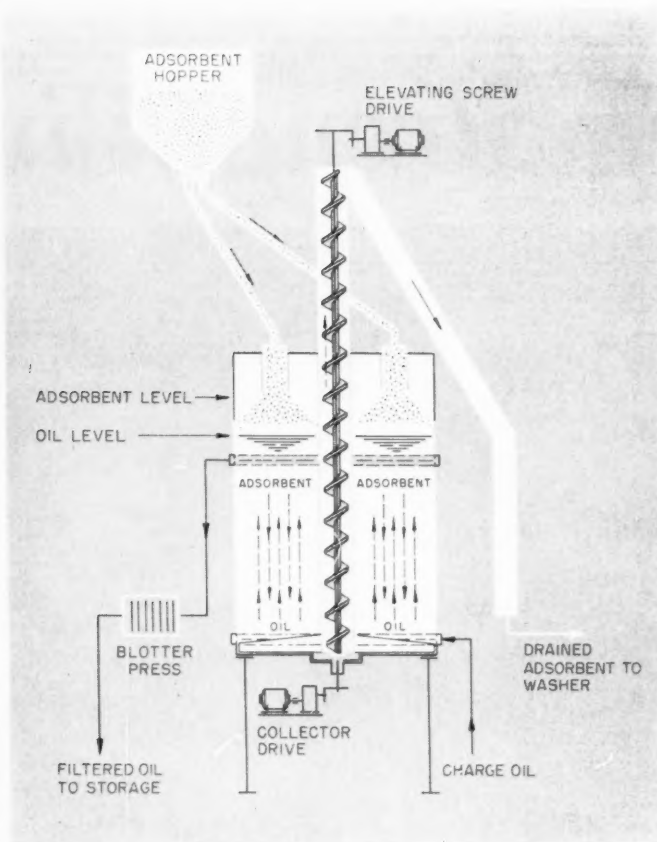
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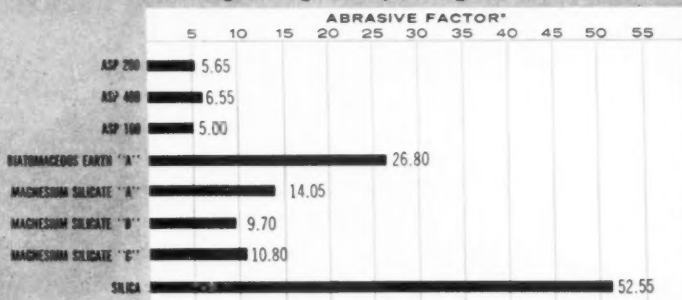
The Imported Fire Ant destroys food, forage and forest... attacks livestock... even bends mower bars with the tough crust of his mounded colony. Now in the South, he could spread rapidly. M & C—leader in the field of carriers and diluents for control poisons—teamed with toxicant people, came up with granular products to control this marauder.

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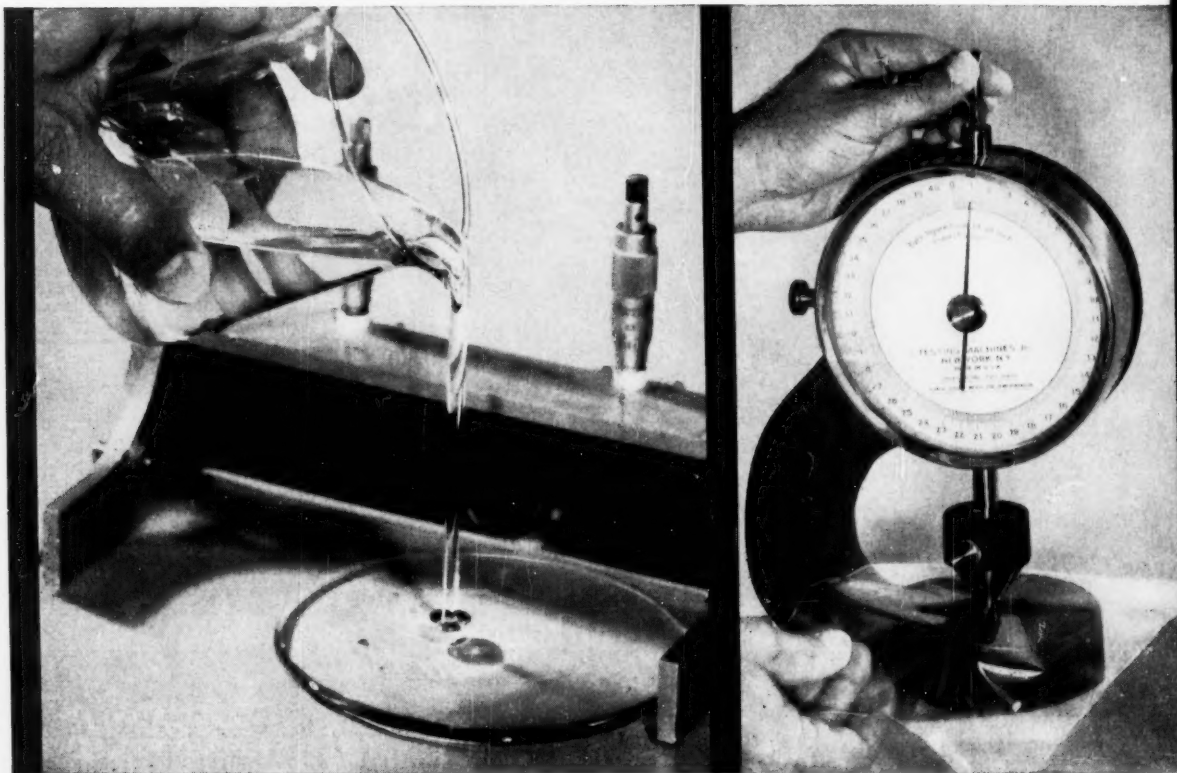
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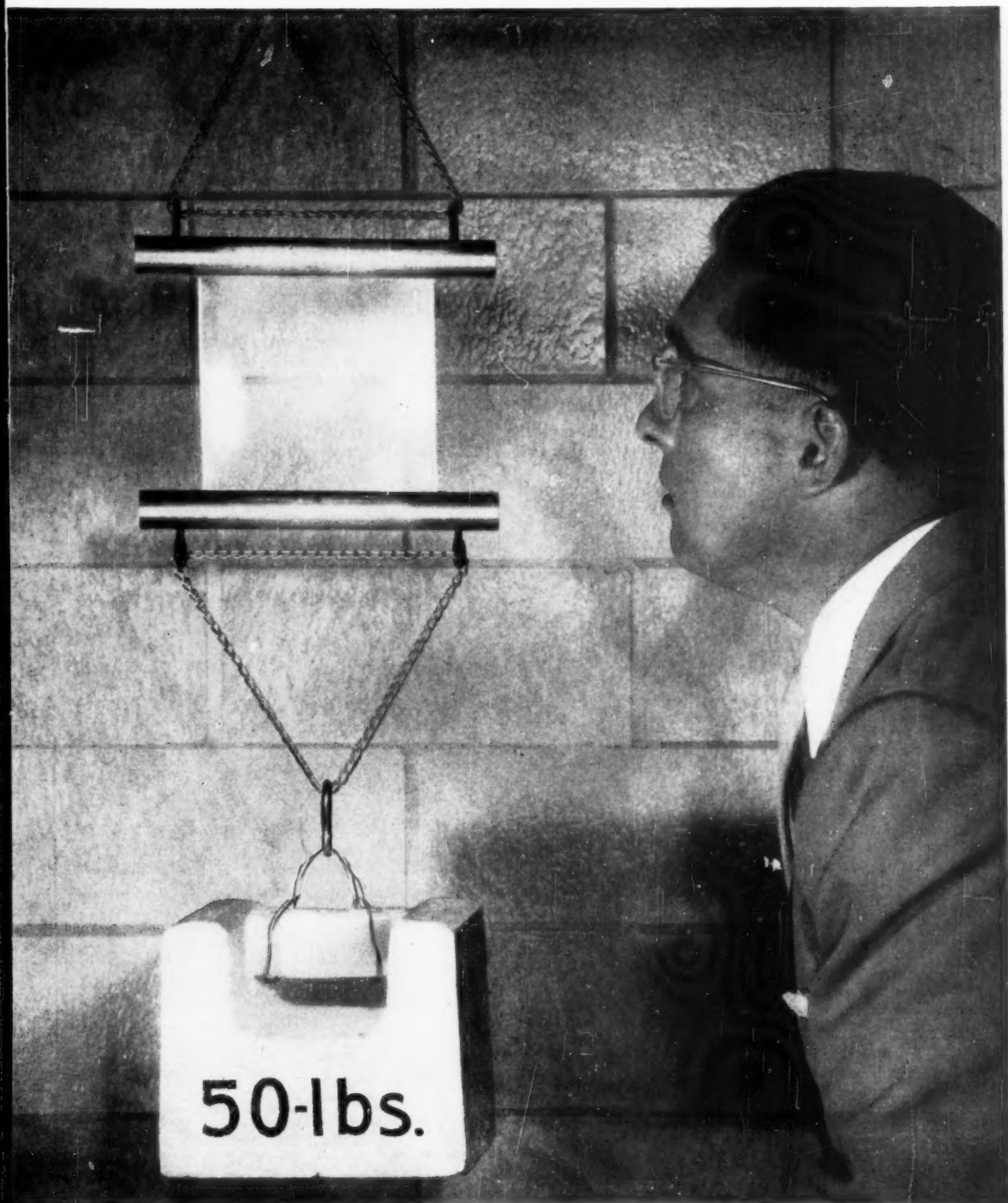
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OPINION

Foreign Investment

TO THE EDITOR: The article (Nov. 9) titled "Sweetening the Pot for Foreign Ventures" has been called to the attention of the Investment Guaranties Staff, and it prompts this letter of congratulations for a good, informative piece of writing.

It is most helpful to our work and to private enterprise in general to have the knowledge of the Investment Guaranty Program spread around in such a readable, interesting manner, and we want to thank you for it.

In fact, we think it is so good that, through our library, we have ordered 100 reprints of it as informational material to give out to interested investors.

CHARLES B. WARDEN
Chief
Investment Guaranties Staff
International Cooperation
Administration
Washington, D. C.

MEETINGS

American Management Assn., special conference on how to plan products that sell, Roosevelt Hotel, New York, Jan. 13-15.

Compressed Gas Assn., 45th annual meeting, Waldorf-Astoria, New York, Jan. 20-21.

Soap Industry Convention, Waldorf-Astoria, New York, Jan. 22-24.

Plant Maintenance and Engineering Show, International Amphitheatre, Chicago, Jan. 27-30.

Society of Plastics Engineers, meeting on Progress through Plastics Engineering, Sheraton-Cadillac Hotel, Detroit, Jan. 28-31.

Instrument Society of America, National Chemical & Petroleum Instrumentation conference, Hotel Du Pont, Wilmington, Feb. 3-4.

Reinforced Plastics Division of Society of Plastics Industry, 13th annual technical and management conference, Edgewater Beach Hotel, Chicago, Feb. 4-6.

American Chemical Society, Philadelphia section, second Delaware Valley regional meeting, Sheraton Hotel, Philadelphia, Feb. 5.

Chemical Market Research Assn., joint meeting with National Assn. of Purchasing Agents; subject: economic projections; Sheraton-Park Hotel, Washington, Feb. 6.

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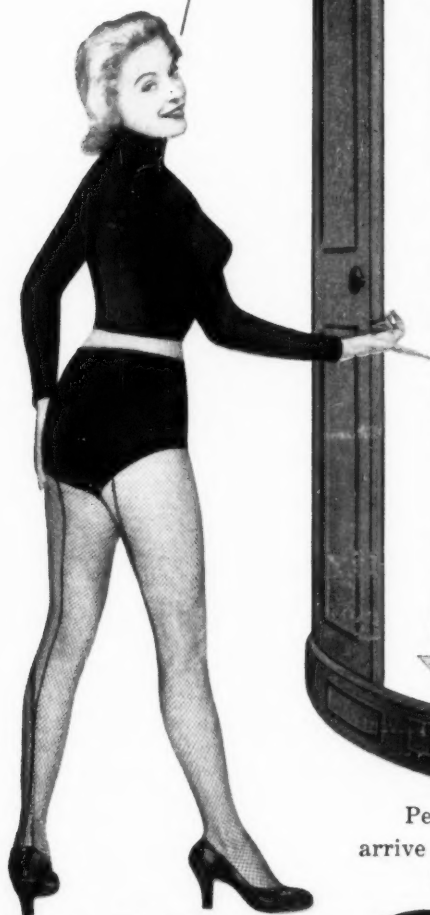
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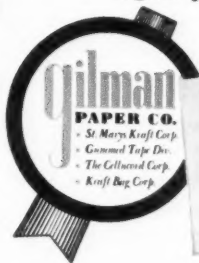
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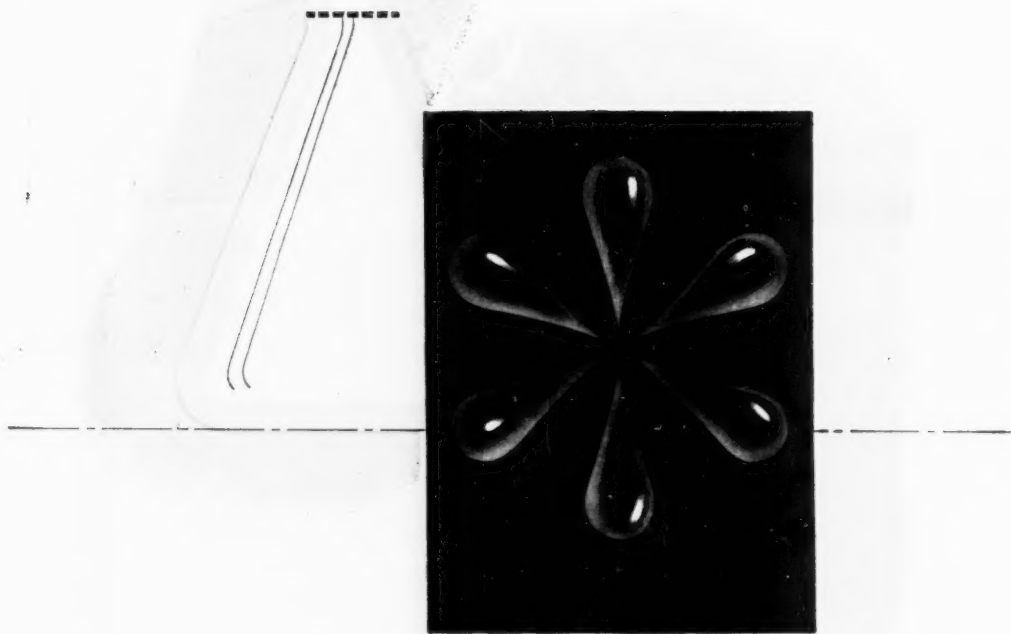
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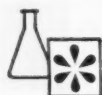


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Business Newsletter

CHEMICAL WEEK
January 4, 1958

Formation of Engelhard Industries, Inc. (Newark, N.J.), with annual sales of more than \$150 million and with numerous plants and sales offices in the U.S. and abroad, is expected this week. The move consolidates into one corporate entity the various companies set up during the long career of the late Charles Engelhard—among them Baker & Co., Hanovia Chemical & Mfg., American Platinum Works, and Azoplate Corp.

It was a rambling house that Engelhard built—a conglomeration of nine interconnected companies dealing in precious metals, chemical catalysts, and dozens of other industrial end-items.

And the need for a unification plan—providing for centralized and coordinated direction of these more or less closely related enterprises—has long been felt (*CW*, Sept. 12, '53, p. 28).

•
Another intracorporate consolidation is in the making at American Cyanamid. This move wraps all of the company's international operations into a new division to be known as Cyanamid International. It's a program in line with the generally rising interest on the part of U.S. industry in overseas market opportunities. Heading the new division with the title of director general: Sidney Moody, Cyanamid vice-president for international operations, and a director of the company.

During the first decade after World War II, the bulk of Cyanamid's overseas business was in products of the Lederle Laboratories Division. Now, President Wilbur (Weed) Malcolm says other divisions' products—notably form and home products, general chemicals, mining chemicals and Formica products—are gaining acceptance abroad. Subsidiary and affiliated companies, many with their own production facilities, are operating in 14 countries. Additional ventures are being launched in other nations.

•
But another chemical company's overseas connections have led to complications. In Rochester, N. Y., the city's purchasing office is holding up the awarding of a contract to Scobell Chemical Co. pending certain "legal and chemical studies."

Scobell was low bidder on a proposed contract to supply sodium silicofluoride for the city's water fluoridation program. Then it was learned that the firm gets the material from a New York distributor who, in turn, imports it from a Netherlands concern. Up to now, all material used in the city's five-year-old fluoridation program has been processed by domestic producers. This question has been raised: Does the imported fluoride meet the specifications laid down by the American Water Works Assn.?

•
Columbia-Southern Chemical's unique water pollution control plan has won the approval of the Summit County officials who govern the area around C-S's Barberton, O., plant. In Akron, county commissioners

Business Newsletter

(Continued)

accepted the company's offer of land and nearly \$1 million in cash for construction of an impounding reservoir. This project—previously endorsed by the state's health and pollution control agencies—is designed to hold to a steady rate of discharge (relative to current stream levels) chloride wastes from the company's plant. The 150-million-cu. ft. lake is expected to be in use early this year.

The county's action came just two days before the eight-state Ohio River Valley Water Sanitation Commission (ORSANCO) submitted its commendatory report on how the valley's industries are complying with the commission's minimum requirements. ORSANCO says it has been collecting data on various chemical contaminants—among them chloride, phenolic wastes, radioactive materials, and various toxic substances such as chromium, copper, cyanide and thiocyanate, fluoride, naphthalene, pyridine, ammonium and sulfur. It is beginning to work for specific controls on emission of industrial wastes into the Ohio River and its tributaries.

•

The railroads' request for another freight rate increase to go into effect Feb. 1 includes a 3% increase on oils, chemicals, rubber goods, insecticides, drugs, etc. Over-all increases sought average out slightly less than a 3% boost. No dollar value of the increases is spelled out, but it will likely amount to around a \$200-million/year higher freight bill for shippers.

Shippers have until Jan. 20 to protest the rate increases. Then ICC will decide on the matter before Feb. 1. Speculation is that the rails will get a good share of what they are asking for. Higher labor and operating costs are reasons given for asking for the increase.

•

Aside from the outlook for higher freight rates, the economic news for the process industries is predominantly heartening.

There are a few events on the bearish side: e.g., Glidden Co.'s sales for the quarter ending Nov. 30 were 9.4% below the figure for the corresponding quarter in '56. Tennessee Products & Chemical Corp. says: "Business conditions are such" that the company can close its electric furnace plant in Chattanooga this week.

Better news: Pittsburgh Plate Glass will build a \$20-million glass-fiber plant near Shelby, N. C.; it's due for completion next January. West Virginia Pulp & Paper is planning a \$40-million debenture issue to continue its long-range expansion program. Parke, Davis & Co. directors—noting that '57 was the best year for sales and earnings in the firm's 91-year history—have declared a regular 50¢ quarterly dividend plus an extra \$1 year-end dividend. And for Lithium Corp. of America, Financial Vice-President H. D. Fellenstein, Jr., is predicting that '58's earnings will top '57's net by "at least" 50%.

BRIEFS

for buyers of

Caustic Potash
Sodium Sulfides
Inert Lubricants
Sodium Chlorate

Facts on caustic potash

While there are a few growing uses for dry forms of caustic potash (notably the powder and flake), about 8.5 out of every 10 pounds of KOH purchased in the U.S. are bought as liquid, either standard or low chloride grade.

Reasons for this are pretty clear: liquid KOH is easier to handle than solid forms, and cheaper to buy (particularly in the higher concentrations).

Shipping strength of liquid KOH is limited, by its penchant for crystallizing in cool weather, to a narrow range between 45% and 52%. Big-volume users sometimes order 52% to keep freight cost down; this is about the practical limit on strength.

NIALK® liquid caustic potash is regularly shipped at 45% to 52% concentration. It is extremely low in iron content.

If your process economics favor a solid form of KOH, you can get a wide choice by specifying NIALK brand. We ship 90% caustic potash as fused solid, flake, granular, walnut, broken, powder, or crushed. ("Walnut" is used in liquefying air; flake and powder often go into cleaning compounds, mixed with caustic soda, soda ash, metasilicates, and phosphates.) We also supply 85% KOH in flake or solid form.

KOH is a "specialty" alkali. You buy it for specific properties you just can't get from other alkalis. Making it takes special skills, too.

You can have confidence in the same skill that pioneered caustic potash on this continent and has supplied NIALK KOH for half a century. We continue to supply a major portion of the total requirements of this country.

Can you pass this sulfide quiz?

Here's a quick way to tell if you're getting good value in the sodium sulfide and sodium sulfhydryte you buy:

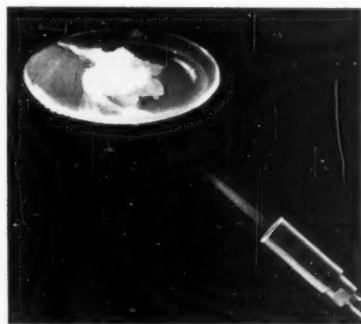
1. Do you always receive sulfide or sulfhydryte in brand-new drums?
2. Is every drum lacquer-lined to prevent iron contamination?
3. Is iron content consistently lower than 10 ppm?
4. Are drum lids sealed so they can't pop open in handling or storage?
5. Can drums be resealed easily?

If you have to say "no" to any of these questions, you're probably risking some contamination in your process. To some, this is a serious matter.

Even if it isn't serious, why put up with it at all—when you can get sodium sulfide or sulfhydryte that's virtually

iron-free, protected by all the safeguards mentioned above?

To do so, simply write *Hooker* on your next purchase order for either of these products. Why not order a trial quantity now?



You can't burn this grease

You may at first be discouraged at the things you *can't* do to this product. But therein lies its value.

Besides being completely nonflammable, it won't break down in the presence of oxygen, hydrogen peroxide, concentrated mineral acids and alkalis. It's unaffected by heat up to 300° C; is stable at very low temperatures, too; is odorless and nontoxic.

What's its name? FLUOROLUBE®. It's a high-density addition polymer of trifluorovinyl chloride. The basic polymer can be fractionated into many grades, ranging from low-viscosity colorless oils through heavy oils to opaque greases. All have excellent lubricating qualities.

Fluorine and chlorine, accounting for nearly 80% of the molecule, contribute to the high densities and complete fire safety of FLUOROLUBES.

What *can* you do with them? Some suggestions: lubricate ultraprecision instruments; seal pumps, valves, pipe joints in equipment handling oxygen, hydrogen peroxide, nitric acid, and other corrosives; lubricate PVC fittings, plug cocks, vacuum pumps in highly corrosive service.

You'll find other ideas on use, plus specifications and typical properties, in a data file on FLUOROLUBES which you can get by checking the coupon.

More NaClO₃ coming

Thanks to our OLDBURY® Products plants at Niagara Falls, N. Y., and Columbus, Miss., we're presently the nation's largest producer of sodium chlorate. But even that isn't good enough to meet *tomorrow's* needs.

The Columbus plant has been in production since 1954. In 1956 we upped its capacity by 5,000 tons per year. Now we're building again. By early 1958, another 5,000 tons yearly will be on tap.

Assuming you're in the market for sodium chlorate, may we submit these three reasons for making Hooker your supplier:

1. Fastest service you can get east of the Rockies.
2. Skilled technical help when you need it.
3. Sodium chlorate of 99.5% minimum purity.

May we spell out these advantages for you in more detail? If so, just write to *Hooker Electrochemical Company* at the address given below.

For more information on chemicals mentioned on this page, check here:

- | | |
|---|--|
| <input type="checkbox"/> Caustic Potash | <input type="checkbox"/> FLUOROLUBES |
| <input type="checkbox"/> Sodium Sulfide | <input type="checkbox"/> Sodium Chlorate |
| <input type="checkbox"/> Sodium Sulfhydryte | <input type="checkbox"/> New list of products—Bulletin 100-A |

Clip and mail to us with your name, title, and company address.
(When requesting samples, please use business letterhead.)

HOOKER ELECTROCHEMICAL COMPANY

701-1 FORTY-SEVENTH STREET, NIAGARA FALLS, N. Y.

Niagara Falls Tacoma Montague, Mich. New York Chicago
Los Angeles Philadelphia Worcester, Mass.
In Canada: Hooker Chemicals Limited, North Vancouver, B. C.





Chemical Week

TAXES:

Antirecession tax-cut possible if unemployment hits more than 5 million. Otherwise, taxes will stay the same.

TARIFFS:

Extension of reciprocal trade law seems certain, but amendments will make it tougher for the Administration to lower rates. Protectionist sentiment will rise, particularly in view of signs of business slide.

MILITARY SPENDING:

Defense outlays—including those for high-energy fuels and nuclear weapons—may grow another \$2 billion by end of '58.

OTHER SPENDING:

Outlook is for increased funds for aid to education, nonmilitary atomic energy, basic and applied research; and for little or no cutback on farm subsidies and public works.

Earnings, Elections Loom over Congress

Bills bearing strongly on '58 chemical industry sales and earnings will be tackled in the Congressional session beginning next week. And Congress is in the mood for action. Reasons: the ominous shadows of Russia and recession are lurking behind many of the measures that will come up in '58.

Congress and the Administration are warily eyeing slimming profits, rising unemployment and growing public anxiety about national security. Both are intent on going into next November's Congressional campaigning with good records on all these counts.

This means there's a good chance of action on some of the bills tied up in committees or shelved for "further study" in '57. But how Congress acts will depend on devel-

opments in the cold war and the national economy.

Upturn Expected: The predicted earnings decline will be a key factor in all economic deliberations. Government economists even now describe the current business-softening as a "recession." But Administration analysts, traditionally cautious, expect an upturn late in '58—thereby slimming the chances of a tax cut. The Administration feels that a cut isn't justified, will not recommend one—at least not right away.

Closely tied to tax prospects is the unemployment outlook. Unemployment has been running around 2.5 million, is likely to hit 3 million early in '58. If it goes to 4 million, there will be strong pressure for antirecession laws. With 5 million unemployed, such laws would undoubt-

edly be passed—with a tax cut first on the list. But, as things stand now, a serious recession and severe layoffs are considered highly unlikely.

More Military Buying: The Administration is expected to ask for a \$500-million increase in defense spending, but most legislators will push for much more. Some top-level government business advisors say outlays will increase as much as \$2 billion, that the military budget will double in 10 years.

All this, of course, would mean a boost in purchases of a variety of chemical materials, more emphasis on metallurgical research, greater demand for nuclear materials and other allied chemical products. In fact, some economists are saying that increased government business may do much to offset a business

downturn—especially in chemicals.

High on the priority list in the nonmilitary category is proposed federal aid to scientific education. Multi-million-dollar programs to subsidize teachers, students, expansion of plants (including lab facilities) and colleges will be adopted. There will also be more tolerance for government-sponsored research and more salary raises for scientists. Over-all aid will likely total close to \$500 million. Chemical companies are expected to derive long-term benefits from greater emphasis on science and new research successes.

Farm Policy Stalled: But there's less agreement on what should be done about farm legislation. Prospects are for little change. Agricultural chemical makers and farm-belt legislators will have a rough time getting any laws favoring price supports. The soil-bank law may be slightly revised to pay farmers for retiring entire farms, in contrast with piecemeal land retirement.

But big changes—which would substantially affect demands for ag chemicals—are unlikely, chiefly because the Administration and Congress are at dead center on farm-price philosophy. In addition, there's no real agreement, even among farm organizations and farm state politicians, as to what is needed. Agricultural spokesmen agree that the farmer's share of national prosperity is too low. Beyond that, they break up into small blocs.

Trade Act Extension: Of more industry-wide concern is foreign trade. Though Eisenhower's request for a five-year extension of reciprocal trade agreements will not go entirely unheeded, any extension won't be for more than one year—and will be substantially modified.

A new antitrust bill will come up requiring big firms to notify the government in advance of mergers.

Committees of the Manufacturing Chemists' Assn. are now caucusing to decide which bills should be backed; and there's a definite increase in the number of chemical company executives taking vigorous stands on national issues. Outlook: when Congress acts, it will do so with full information about the CPI's needs and problems.

Chemical Fuels Milestone

The U.S. Air Force last week took a step that could greatly expand the market for high-energy chemical fuels. It awarded to North American Aviation, Inc., a contract to design and develop a 2,000-mph. "chemical bomber."

The huge jet-engined plane—which won't be flying till 1960—will burn boron-based fuels in enormous quantities. One estimate: 25-30,000 lbs. an hour. Production of such "zip" fuels is now limited to requirements of military missiles; production capacity now would not nearly be sufficient to supply a fleet of bombers, even with enough fuel for routine reconnaissance flights.

But that won't be the case by the time the bomber goes into production. Olin Mathieson Chemical Corp. already has a semicommercial plant in operation at Niagara Falls, N. Y. By the end of February, a second plant—to be built by OM for the Navy at nearby Model City, N. Y.—will treble present output. And by mid-'59, OM will complete a \$40-million Air Force-owned boron fuel unit, also located at Model City (*CW*, July 20, '57, p. 35). Moreover, Callery Chemical Co.—so far under contract only to the Navy—will complete a \$38-million high-energy fuels plant in Muskogee, Okla., by next January.

Billion-Dollar Business: Olin Mathieson Executive Vice-President William Foster estimates that production of high-energy fuels will become a \$1-billion industry within 10 years. Another spokesman adds that high-energy fuels production will increase 20-fold within the next 18 months. And Lyle Herndon, vice-president in charge of OM's high-energy fuels work, says the Model City plant's capacity will probably increase 100-fold in the next two decades as wider applications for the fuels are found.

Other firms aren't overlooking this big potential. Besides Boeing and North American—which were vying for the "chemical bomber" design contract for more than two years—United Aircraft Co. is believed to be working on problems of adapting



OM's Herndon: On tap, 100-fold capacity boost.

boron fuels to jet-engine systems.

General Electric Co. has operated a pilot plant for making pentaborane, has at least one patent on the use of the fuel, and probably several more. Stauffer Chemical, U.S. Borax & Chemical, and American Potash & Chemical are establishing themselves as basic materials suppliers.

Also, American Potash, National Distillers and Food Machinery and Chemical—through their jointly owned firm, A.N.F., Inc. (Henderson, Nev.)—have an Air Force contract to develop high-energy fuels.

Alkali Intermediates: In addition, Metal Hydrides Inc. has signed a \$9.2-million contract to supply sodium borohydride as an intermediate, recently completed a \$5.5-million Air Force-Navy-sponsored plant at Danvers, Mass., to produce it. Lithium Corp. of America, which makes another intermediate, lithium hydride, is reportedly boosting its production by 300 lbs./day and will probably sell \$3 million worth to the government.

Several big oil firms, including Gulf Oil—which recently bought a 25% interest in Callery Chemical—are also researching boron fuels.

States Study Tax Rises

New laws that could be of major significance to nearly 50% of the nation's chemical process industry will be up for debate in 21 state legislatures this month. Prime topics will be measures on taxation, water supply, pollution control and labor relations.

States whose law makers will be in session debating bills that directly affect the profitability or feasibility of chemical manufacturing operations are: Arizona, California, Colorado, Delaware, Georgia, Kansas, Kentucky, Louisiana, Maine, Maryland, Massachusetts, Michigan, Mississippi, Missouri, New Hampshire, New Jersey, New York, Rhode Island, South Carolina, Virginia and West Virginia.

Tax and revenue problems will be top issue in many states this year. There's little indication now of any general shift from the trend since the end of World War II toward higher state tax levies. Though there's been more pronounced interest in governmental economy during the past year, other factors now appear likely to force state lawmakers to enact new and increased taxes in a number of instances.

For Aids to Industry: One state where process industry management will be paying close attention to new tax bills: West Virginia, which ranks about 12th in volume of chemical production. Like most states, West Virginia is seeking (a) more industry and (b) more tax revenue. And Governor Cecil Underwood—a 35-year-old Republican, and an ex-educator—holds that those two goals are inseparable.

"Many of the necessities of industrial expansion must be provided by state action," Underwood declares. "And these services must be equitably paid for by the state without imposing excessive, unjust taxes."

So far, there have been two new tax proposals to provide additional revenue for West Virginia's state government—and either or both could prove burdensome for chemical companies there. One comes from a Kanawha Valley legislator—State Rep. Homer Caldwell, of Charleston—who's drawing up a bill for a tax on all manufactured products sold within the state. This would appear to cover chemical products pipelined to adjacent plants of different owners; it would not apply

to products made in West Virginia but sold outside the state. The other new tax scheme—a suggestion by Miles Stanley, first president of the newly merged West Virginia Labor Federation (AFL-CIO): "a depletion tax on the state's vast store of natural resources and a tax on income."

Millions for Water: Supplies of water for municipal and industrial use constitute a problem that is considered critical right now in some states, and something for future action in other states. California's State Water Resources Dept. is asking for \$77 million during the coming fiscal year. This money—proposed to be taken out of tideland oil royalty reserves—would be used to further the Feather River water transportation facilities and for other water projects. If an intrastate dispute over water rights can't be settled before the legislature begins its budget session Feb. 3, it's likely



W. Va.'s Underwood: He sees need for revenue to spur industrialization.

that a special session may be convened later to take up this program.

In Missouri, on the other hand, the legislature will be called upon to formulate a long-range state water-use policy, but won't be asked to appropriate money for specific projects. The legislature has been warned by a St. Louis County group that Missouri is losing out industrially because it lacks laws to guard plant sites against floods

on the one hand and against drought-year water shortages on the other. "We can progress only as rapidly as our water legislation will permit," a county spokesman asserts. "It is essential to hold our economy together." The proposal calls for ultimate construction of a system of multiple-purpose dams, to be operated by a state water authority.

Pollution and Pickets: In many of the 21 states, legislators will continue to press for new and more stringent laws to curb industrial pollution of atmosphere and streams. There's a tendency now for states to set specific limits on discharge of various chemical contaminants.

Spurred by revelations by the U. S. Senate's special committee on labor-management relations, numerous state lawmakers will introduce bills aimed at curbing alleged abuses in this field. Examples: new restrictions on picketing, requirements for secret ballots in union strike polls, requirements for unions to submit detailed financial statements, and prohibitions against collusive agreements between unions and employers.

Where these tax and nontax measures would have dollars-and-cents impact on operations, management is generally ready to testify before legislative committees—but can't always count on being invited.

Betting More on Drugs

Capitalizing on the fact that pharmaceutical sales and earnings are holding firm despite current recessionary trends, Joseph E. Seagram & Sons will boost its investment in the drug industry. The big distilling concern plans a multimillion-dollar expansion and diversification program for its pharmaceutical subsidiary, The Pharma-Craft Corp.

Main production and executive facilities will be shifted from Batavia, Ill., to Princeton, N. J. And the subsidiary—up to now solely in the proprietary drug business, with only a few products—plans to enter the ethical drug market soon with a dermatological preparation still being test-marketed in the Chicago area.

In the past three years, Pharma-Craft sales have tripled—to \$9 million in '57—may reach \$12 million this fiscal year. Advertising budget for '58: \$5 million.

EXPANSION

Urethane Foam: Dayton Rubber Co. is expanding production facilities and forming a new division to meet rapidly expanding demand for polyester and polyether urethane foam. All Dayton Rubber plastic foam-products will be marketed under its tradename Stafoam.

Hydrogen Peroxide: Du Pont of Canada has started construction of a \$2-million hydrogen peroxide plant at its Malton, Ont., works, expects to complete it by late spring.

Pulp and Paper: Plans by Alberta West Forest Products Ltd. for a \$25-million pulp and paper mill have reached the engineering study stage, with Edmonton, Alta., the likeliest site area. Johnson & Johnson (Chicago) is making engineering studies, using recommendations of Bauer Bros. (Springfield, O.). Initial design capacity will be 300 tons/day.

Finishes: With the addition of 33,000 sq. ft. of plant area, Carolina Paint & Varnish Co. (Greensboro, N.C.), has increased capacity 40%. The firm, a division of United Wallpaper Co. (Chicago), manufactures industrial and home finishes for distribution in the South.

Paper: Nekoosa-Edwards Paper Co. has launched a \$500,000 expansion and improvement program at its Potsdam, N.Y., mill. A new single-stage, hypochlorite continuous-bleaching facility will have a 35-tons/day capacity, is designed for expansion into a 100 tons/day, three-stage plant.

Sulfuric Acid: First Mississippi Corp. will build two 70,000-tons/year concentrated sulfuric acid plants at Pascagoula, Miss. One will be operated by Coastal Chemical Corp., a First Mississippi subsidiary. The other plant will adjoin it, producing 50,000 tons/year for the open market, and 20,000 tons for Coastal.

COMPANIES

National Lead Co. and Celanese Corp. of America are joining forces to develop polymers for plastics and fibers. Concurrent research at a laboratory of each company will deal with organotitanium polymers developed by National Lead.

Crucible Steel Co. of America has acquired full ownership of Rem-Cru-Titanium, Inc., from Remington Arms Co. Crucible exchanged 150,000 shares of newly issued stock for 5,000 shares and \$2.8 million in notes of Rem-Cru. Says Crucible President Joel Hunter: "Crucible has acquired properties needed for growth in special steels."

Vulcan Materials Co. (Birmingham, Ala.) has won stockholders' approval to acquire Union Chemical &

Materials Corp. (Chicago) and several Tennessee concerns, including Lambert Bros., Inc., Brooks Sand & Gravel Co., Ralph E. Mills Co. and Wesco Paving Co. But Vulcan management is hesitant about final steps toward acquisition. One possible hitch: the \$9.3-million damage suit filed by a director and former vice-president against Union and two other directors over alleged "diversion of corporate opportunity." The charges involve the acquisition of a gas system.

Callahan Zinc-Lead Co. and Vulcan Silver-Lead Corp. are considering a merger. Callahan now owns 62% of Vulcan's outstanding shares. Vulcan owns and operates a copper-silver ore body in the Coeur d'Alene district of Idaho, and owns silver-lead property now being developed by American Smelting and Refining Co. Callahan is exploring in Canada, but is not operating.

Fibreboard Paper Products Corp. (San Francisco) has sold the assets of its wholly owned subsidiary, Fibreboard Products (Eastern Division), including two paperboard converting plants at Philadelphia and Baltimore. Proceeds will go toward expanding Fibreboard's "primary facilities."

FOREIGN

Uranium/Argentina: Argentina has received the first U.S. shipment of uranium in oxide form, an 80-lb. lot of uranium, 20% U-235. The material, worth \$110,000, has been "rented" to Argentina for \$5,000/year as fuel for a 3,000-kw. reactor. Argentina plans to eventually use domestically mined uranium.

Atomic Reactor East Germany: East Germany's first atomic reactor has started operating at Rossendorf, near Dresden. The 2,000-kw. water-cooled reactor was supplied by Russia.

Plastics Austria: Austria's privately owned plastics industry produced some 6,910 tons (including finished products), worth \$8.1 million, during the first half of 1957. This is more than half the output in '56, 9,410 tons, worth \$11.4 million. Raw-material imports have risen sharply. In '54, they totaled 4,020 tons; in '56, 8,250 tons. The '57 total may hit 12,100 tons—67% from the U.S. Biggest item on the import list is polyethylene (520 tons were imported during the first half of '57), followed by urea, melamine and polystyrene.

Austria's plastic exports totaled 1,615 tons for the first half of '57.

Polyethylene/Germany: Scholven-Chemie AG. (Gelsenkirchen), government-owned petroleum refiner and chemical maker, plans to build a 6,000-tons/year Ziegler-process polyethylene plant; it will go onstream at the end of '58. A pilot plant is already producing the low-pressure polyethylene.

facts you should know
about dryers . . .



HOW TO BENEFIT THROUGH USE OF A STEAM TUBE DRYER

For over 55 years, Louisville Dryers have been solving industry's drying problems and effecting marked economies. This experience can often be applied to provide unusual benefits in specific cases, possibly yours, for example . . .

Q. *Since avoiding dust loss and contamination by furnace gases indicates the choice of an indirect heat rotary dryer for my material, what type of indirect dryer would you recommend?*

A. Unless there are abnormal conditions, we would recommend a steam tube dryer, especially if the material is heat sensitive.

Q. *What advantages does the steam tube dryer offer in comparison with indirect fire types?*

A. There are many advantages. One is ease of operation and low maintenance costs due to the definite moderate temperature (established by steam pressure) imposed on both

the material being dried and on the dryer itself. Another advantage is that there is no furnace refractory maintenance. Still another advantage is quick "warm up" and "cool off". In many cases where the drying operation is intermittent, there is no need to shut off the steam supply or stop rotation when the wet material feed is interrupted since steam is condensed in quantity only when wet material is fed.

Q. *Isn't steam supposed to be an expensive drying medium?*

A. That depends on how the steam is used. It is true that a low overall efficiency results (often as low as 25%) when steam is used to heat air for low temperature drying. However, the Louisville Steam Tube Dryer normally utilizes 85% or more of the available heat in the steam. By combining this with a reasonable minimum efficiency of 80% in modern

small steam generators (and higher in large boiler plants), you get an overall efficiency close to 70%. This compares with indirect fire dryers which develop an efficiency seldom higher than 50% and generally less.

Q. *Does material insulate the tubes by sticking to them or by clogging the spaces between tubes?*

A. Very few materials have this tendency to any serious extent and most of these, when properly conditioned before feeding, handle without difficulty. For the balance, no dryer using heated surfaces for heating the material is a proper application.

Q. *How can I be sure a Steam Tube Dryer will handle and dry my material satisfactorily?*

A. The General American dryer pilot plant is at your service. No charge for routine tests and demonstrations. No obligation, either. Write for test date.



LOUISVILLE DRYING MACHINERY UNIT

GENERAL AMERICAN TRANSPORTATION CORPORATION

Dryer General Sales Office: 139 So. Fourth Street, Louisville 2, Kentucky

Eastern Sales Office: 380 Madison Avenue, New York 17, New York

In Canada: Canadian Locomotive Company, Ltd., Kingston, Ontario, Canada

General Offices: 135 S. La Salle Street, Chicago 90, Illinois

Washington

Newsletter

CHEMICAL WEEK

January 4, 1958

Searching re-examination of our ability to meet the Soviet threat

to U. S. security will highlight the new session of Congress opening next week. Reverberations will be felt in the chemical process industries and throughout business in general.

Already, several investigations into defense problems are scheduled; and, with nearly all of Congress' 230 committees casting about for some way to catch a bit of the glare shed by the Sputniks, you can look for a proliferation of such inquiries in the months ahead.

The White House will play a big role in setting the limits—determining the real attention-getting issues for Congress. Three major Presidential messages are due to be submitted to Congress in the next few weeks—and Congressional leaders usually wait for these before setting their own legislative plans.

The President's State of the Union Message will come the week Congress opens, probably Jan. 9—two days after Congress convenes. It will outline Administration views of our cold-war posture, preview in broad-brush strokes what Eisenhower and his aides feel is needed to maintain a strong America and contain Russia's expansionist aims. This is usually followed (a week or 10 days) by the President's budget—detailed spending requests for a host of federal agencies wrapped up as the Administration's program for the fiscal year ahead—in this case, the year starting July 1, 1958. And then (late in January) will come the President's economic report—the official line on how Eisenhower's top economic advisors size up current economic trends, the measures to be expected from Washington to sustain business growth and full employment.

The message will signal a harsh battle for policy control—with Congress and the Administration vying as never before for the upper hand in running the country. Such rivalry is a familiar part of our history, particularly when different parties control the White House and Congress. But, the conflict will be heightened now that the Democratic party leadership feels it has some good issues (the U.S. lag in missiles, rising consumer prices and unemployment) with which to beat the Republicans out of the White House in 1960—when Eisenhower retires. By the same token, the U.S. Presidency has steadily grown in power and most people look to the President—not Congress—in times of crisis.

•

Congress will counter White House moves, and try to take the play in major policy determination. Its investigating committees are well-staffed with outside experts helping to make for more effective probing. And, lately, Congress has been leaning more on the outside experts for key testimony—evident in Senator Johnson's Preparedness Subcommittee hearings and the use of panels of experts in major inquiries of the Joint

Washington Newsletter

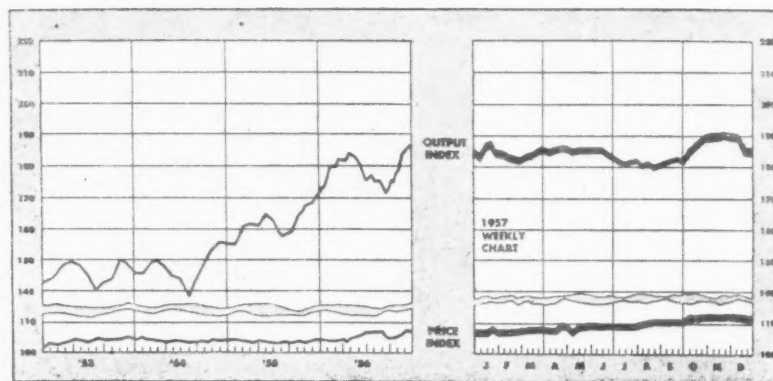
(Continued)

Economic Committee, and, closer home, by the House Health Subcommittee for advice on the chemical food additive control issue.

You'll see more of this in the upcoming investigation—billed as “the most fundamental study of defense policy ever made by this committee”—that the House Armed Services Committee will launch Jan. 7. The group will operate behind closed doors, but plans daily press briefings on the testimony.

The Defense Appropriations Subcommittee under Rep. George Mahon is prepared for a more authoritative review of Pentagon spending requests. Its wide-ranging hearings held this past summer may result in the subcommittee's moving more boldly into policy matters. Other inquiries already slated will go into civil defense needs, military procurement (there will be talk of a firm lid on defense contractors' profits as well as more “incentives” for missile program contractors).

Congress, when the shooting's over, is expected to settle pretty much on juicing up existing policies, rather than calling for new directions in U.S. strategy. Early indications point to such an outcome in foreign policy despite the pressures from NATO allies (and domestic critics) for a bigger U.S. effort to negotiate political and arms settlements with Russia fight out the cold war with economic-aid weapons. But, few expect Congress to heed such advice—not until it has the U.S. defense program back on track.



Business Indicators

WEEKLY

	Latest Week	Preceding Week	Year Ago
Chemical Week output index (1947-49=100)	186.0	187.0	185.0
Chemical Week wholesale price index (1947=100)	111.1	111.3	107.3
Stock price index of 11 chemical companies (Standard & Poor's Corp.)	39.28	38.92	45.08

MONTHLY

	Latest Month	Preceding Month	Year Ago
Wholesale prices (Index 1947-1949=100)			
All commodities (other than farm and foods)	125.7	125.8	124.2
Chemicals and allied products	110.3	110.4	108.2
Industrial chemicals	123.6	123.6	122.5



ESSO LAKTANE *RSVP*

Here's an unusual solvent in search of further uses. Wherever you need a high-solvency, fast-drying solvent with controlled evaporation, a "clean" odor, low residue, and reasonable price, we suggest that Esso Laktane may well be able to *cut your costs and improve the results*. A product of Esso Research, it is already the proven quality-leader in rotogravure printing and in the lacquer industry. But we think you'll be interested in its uses in producing neoprene rubber products and vinyl organosols, among many other potential uses. With uniform quality and *immediate availability* as well as *low cost*, you'll find that you are indeed *answering an invitation to higher profits*. Esso Standard Oil Company, Inc., 15 West 51st Street, New York 19, New York.



PETROLEUM SOLVENTS

ADMINISTRATION



Geneva headquarters of ILO will be scene of February's fifth session of the international labor group's

Getting Ready for World Chemical-

First look at two items on the agenda of the upcoming fifth session of the Chemical Industries Committee of the International Labour Organization (ILO) was available to chemical management this week. The sessions will be held Feb. 10-21 in Geneva, Switzerland, and 21 nations* have been invited to attend.

Items: First item on the agenda is a general report of recent events and developments in the chemical industries, worldwide. ILO has scheduled papers on atomic energy, technical and scientific manpower shortages, profit-sharing schemes, and the perennial issue, hours of work in the industries.

Most likely of prime interest, particularly among labor representatives, will be discussions and recommendations arising from studies of atomic energy. Since the chemical industry has become one of the prime agents in the preparation of atomic materials, chemical labor organizations have

taken a strong interest in such relatively unexplored matters as the location of atomic-chemical facilities, training of workers, safety, and labor-management relations. ILO has detailed these for discussion.

Ahead of the Goals: Varying degrees of interest are being taken in the other subjects. Working hours, though deemed important by most nations, have become a usual item for discussion—but U.S. labor and employers alike tend to look on the matter as largely academic because goals set in these discussions are generally an accomplished fact in the U.S.

The engineering and scientific manpower shortage is due for wide discussion because of the accelerated attention it has been getting since the Soviet Union demonstrated its technical competence in raising the first earth satellites. But U.S. process management and labor representatives, already widely split over the issue, may find themselves following well-known trails.

Expectations are that discussions of

profit sharing will result in a better definition of profit sharing in terms of stock participation programs as opposed to actual division of profits among employees.

Industrial Relations: Second item on the agenda is a study of industrial relations in the chemical industries. This ranges through a wide selection of topics, including the fundamental rights of workers, the mechanics and regulation of negotiation, settlement of disputes, and the levels—social and administrative—at which industrial relations operates.

Points proposed for discussion include collective bargaining and agreements, the settlement of disputes, and a review of details of collective work stoppages. Discussions will cover the role of groups such as works councils and production committees in achieving conciliation and cooperation. Examination will be made of their establishment, their structure and their duties. Still another topic will be the protection from penalization by management of participants in labor move-

*Argentina, Austria, Belgium, Canada, Chile, Denmark, Finland, France, West Germany, Greece, India, Israel, Italy, Japan, Mexico, Netherlands, Norway, Sweden, Switzerland, U. K., U. S.



chemical industries committee

Labor Talks

ments, particularly those seeking holding and leaving union office.

In addition, conferees will discuss the measures employers are required to take to help workers' councils to operate, including provision of space, equipment, and time off.

Some U.S. observers point out that although the U.S. has a strong interest in the development of international labor relations, many topics are of only slight interest to the U.S. This is because our industrial relations—like our wage policies—are comparatively advanced, and recommendations made by ILO are frequently already in force here.

Though U.S. delegates to the conference haven't yet been announced, the contingent, as always, will be tripartite, with representatives from employers, employees and government.

Some time ago, employer members of ILO's Chemical Industries Committee had sought to postpone the meeting until late in '58, but were unsuccessful. So, the original dates are now definite.

States Win Judicial Power

Process industry management last week was looking closely into the broad significance of the U.S. Supreme Court's recent unanimous ruling broadening the role of state courts. The high court ruled that a state court has jurisdiction over a corporation that has never done any regular business in that state.

Simply put, the decision means that anyone with a complaint against a company may sue that company in his own state courts, need not go to the courts of the state where the company is chartered.

One possible result: an increase in air pollution suits involving chemical company plants located near state borders. Residents of adjoining states will be more inclined to seek damages for alleged air pollution, now that their own state courts may have jurisdiction.

Although the decision was rendered in an insurance company case (*McGee vs. International Life Insurance Co. of Texas*), it is expected to affect corporations generally, since the opinion was not restricted to the insurance business.

Indicating that the decision probably will work to the advantage of the plaintiffs, Justice Hugo Black wrote, in part, for the court:

"These residents would be at a severe disadvantage if they were forced to follow the insurance company to a distant state in order to hold it legally accountable. When claims were small or moderate, individual claimants frequently could not afford the cost of bringing an action in a foreign forum—thus, in effect, making the company judgmentproof."

The decision was the latest of a number in which the high court has gradually reduced the effectiveness of a precedent set by a basic decision made in 1878, in the case of *Pennoy vs. Neff*. The court held then that state courts could not have jurisdiction over a "person," including a corporation, unless he or his agent were found physically within the state and served with legal process there.

Relaxation: This ruling has been relaxed in recent years. State courts have been allowed to serve process by mail and take jurisdiction where out-of-state corporations have had a

minimum number of contracts within the state, have had traveling salesmen in the state, or have carried on regular mail solicitation within the state.

In the latest case, however, the court said, the insurance company had never had offices or agents in California and never solicited or done insurance business in the state, apart from the policy involved.

The case arose from a \$5,000 policy bought in 1944 by a California resident from an Arizona company. In '48, a Texas concern took over the Arizona corporation's insurance business, offering to continue the Californian's policy. He accepted and paid premiums by mail.

When he died in '50, the beneficiary wrote for payment, but the company refused. The beneficiary sued in a California court, and the company was served with legal process in Texas by registered mail.

The beneficiary won by default, but couldn't collect in California because the insurance company had no agent there. The beneficiary then went to the Texas courts, which ruled that California had not had valid jurisdiction over the Texas concern in view of the *Pennoy* decision.

The Supreme Court reversed the Texas court and, in effect, ordered Texas to honor the judgment.

Pressure on Union

The U.S.-based Oil, Chemical & Atomic Workers Union says "outside" forces are trying to set aside the decision of Canadian National Federation of Chemical Workers to merge with OCAW. NFCW voted at its Montreal convention to join OCAW's District 16, bringing with it 4,500 members.

At that time, they left the Quebec Catholic Syndicate, a move that local observers think may ease management's mind in the vast St. Maurice Valley. Reason: the syndicate has made persistent demands for a long list of so-called "comanagement rights," a stand not taken by the international OCAW.

Now, says OCAW, strong pressures are being exerted upon the Canadian federation to come back into the syndicate fold.

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ADMINISTRATION



WIDE WORLD

Judge Taylor: For an aluminum trial, visits to the farm.

LEGAL

Pollution Trial Set: April 7 has been set as trial date for a suit by 160 Blount County, Tennessee, residents against Aluminum Co. of America.

The suit, filed in July '55, asks \$2.8-million damages, alleging that fumes from Alcoa plants damaged crops, cattle and land. Several claimants have settled out of court since the suit was filed.

Federal Judge Robert Taylor said it would take "weeks and weeks" to settle the Alcoa suit; and attorneys said there would be two trials, one on the liability issue, the other to determine the amount of damage due each farmer, if Alcoa is found liable.

Judge Taylor said the jury would inspect 87 farms for alleged damage.

Atomic Radiation Suit: A \$10,000 damage suit has been filed against Union Carbide Nuclear Co. and others on behalf of a chemist allegedly made mentally ill by exposure to atomic radiation.

The suit—filed and withdrawn in '56—has been refiled in U.S. district court (Knoxville, Tenn.) on behalf of Mary Ellen Lee. She has been in an Ohio mental institution since '55.

The suit claims she was exposed to radioactive material while working at Oak Ridge as a chemist in 1948-51 for Fairchild Aviation Corp. and in 1951-53 for Carbide. The firms operated the Oak Ridge atomic facilities for the Atomic Energy Commission.

LABOR

Glass Arm: Corning Glass Works and two locals of American Flint Glass Workers Union have signed a one-year pact covering 6,300 workers at Corning, N.Y., at nearby Horseheads, N.Y., and at Wellsboro, Pa., plants.

The contract calls for an increase of 7½¢/hour, or 3.5%, whichever is greater, and for an improved pension plan. Though wage and pension provisions are retroactive to Nov. 25, the contract becomes effective Jan. 20, when the old contract expires.

Carbide Vote: In Charleston and Institute, W. Va., construction workers of Union Carbide's Chemical Co. Division have voted overwhelmingly against union affiliation.

In one election, ordered by the National Labor Relations Board, 163 out of 244 voting (254 eligible) pipe-fitter-welders, blacksmith-pipe hangers, pipe inspectors and their helpers rejected representation by Local 625 of United Assn. of Journeymen and Apprentices. In another election, 724 employees (of an eligible 744) voted 588 to 136 against joining Charleston Trades Council.

KEY CHANGES

John A. Field, to vice-president—marketing, Union Carbide Chemicals Co.; and **Davenport West, Jr.**, to vice-president, Union Carbide Ore Co.; divisions of Union Carbide Corp.

W. E. Hanford, to vice-president for research, Olin Mathieson Chemical Corp.

Walter F. Rhoades, to vice-president of marketing, United Wallpaper (Chicago).

William McLaren Bristol, III, to president, Products Division, Bristol-Myers Co.

O. B. Mason, to corporate director of organization; **George H. Sheets**, to manager, Chillicothe Division; **Edward H. Niederauer**, to general manager, white paper operations; and **P. Frank Winkler**, to general manager, board operations; The Mead Corp. (Dayton, O.).

Raymond H. Filsinger, Jr., to director, Vanadium Corp. of America.

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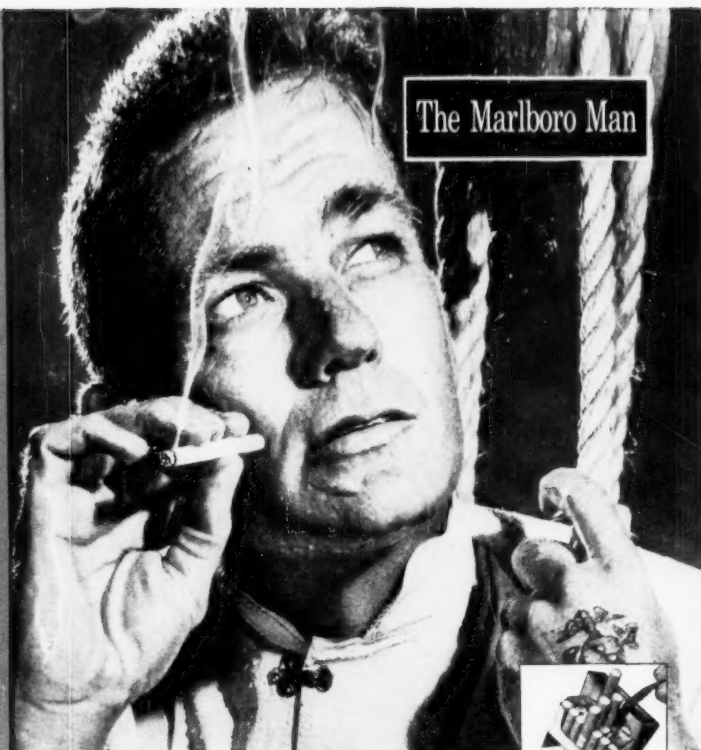
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SPECIALTIES

• It'll be the big food and the larger contract-filler who'll do most of the filling of the high-volume food products. Special handling requirements, expensive-to-buy-and-run equipment, and space requirements will rule out the smaller outfits.

Nitrogen

Despite the generally rosy outlook of most fillers about nitrogen for foods, there are some in both the food and the aerosol industries who are un-

30

Packing Fills Out the Aerosol Picture

convinced about its real potential value. Cautious aerosolers feel that nitrogen is just a stop-gap measure until the "right propellant" comes along for food packaging. And some food packers are against aerosols in any form. Says one, "Aerosols aren't going to sweep the food industry. At first, they might catch on as a novelty, but then they'll fall flat on their face."

Sure to be a problem in the development of aerosols in the food field is added product cost. While the housewife will pay \$1.25-\$1.50 for an aerosol insecticide, she may be more reluctant to spend that for a can of mustard. To bring the cost of the product down, higher-speed aerosol loading equipment will have to be designed.

Equipment High . . . Mojonnier Associates, Inc.—the nation's largest manufacturer of aerosol filling equipment—says that at the present time, the equipment for filling food aerosols—all are pressure-filled—has top speed of 44 containers/minute—single line. Cost: \$13,700. This compares with filling-speed of 350 bottles/minute of catsup, 120 pints/minute of mayonnaise and 1,000 jars/minute of baby foods, that the food industry now depends on. Mojonnier now has drawing-board plans for aerosol equipment that will fill 150-300 cans/minute. Estimated cost of Mojonnier's in-the-works, high-speed rotary filling, crimping and gasser line is \$50,000-\$75,000—without the necessary sterilization equipment.

Even if food companies are completely sold on the idea and can afford the equipment, they'll still have to wait many months for delivery. One result of this equipment shortage will be that the few food items offered in '58 will undoubtedly be the luxury, high-margin food products. If these catch on, *CW* estimates that from 10-15 million units—hardly a "revolution" in food packing—will be nitrogen-propelled in '58, only about 2-3% of the entire aerosol market.

Propellant Low: These limited market prospects hold in spite of the very appealing low cost of nitrogen. The idea of a low-cost propellant is most attractive to packers of food

products. They would need to buy only about 15¢ worth of nitrogen to package 1,000, 6-oz. cans of food products. By comparison it takes \$215 worth of fluorinated hydrocarbon propellant to power 1,000 6-oz. cans of insecticide. This has been one factor that makes nitrogen appealing not only for foods but for nonfoods as well.

Nitrogen for Nonfoods? Here's why low-cost propellents look good to a shave cream maker—it takes only ½ gram of nitrogen to fill that 6-oz. shave cream can, while it takes 27 grams of fluorinated hydrocarbon. The small amount of propellant required to fill a shaving cream unit, isn't quite the advantage it seems, however—there's the problem of valve leakage. Considering that 1-2 grams of propellant—any type—are lost through the valve each year, according to industry estimates, it's obvious that this makes it imperative to have on the nitrogen units a better valve than on those that use conventional propellents.

Aggravating the leakage problem is the fact that nitrogen-filled products are packed at higher pressures (90 lbs./sq. in.) than are products packed with fluorinated hydrocarbons (60 lbs./sq. in.). This higher pressure is necessary, though, to drive the product out of the can because nitrogen pressure does not remain constant for the life of the container as does the pressure produced by liquid-vapor combination of fluorinated hydrocarbon propellant.

This sometimes results in part of the product being left in the container because there's not enough pressure left in the can to empty it. Part of the waste—estimated to be 10% of content—is lost because the formulation clings to the container wall. One filler, Aerosol Techniques, claims to have eliminated the problem of content sticking to the can. It says that with special linings it has developed (patent applied for) for cans, it's possible for the consumer to get all but 1% of the contents (at a residual pressure of 20 psig.).

Just how long nitrogen will remain in the propellant picture is a controversial point. Some aerosolers think

that as soon as the fluorinated hydrocarbons get the approval of the Federal Food and Drug Administration for food use, nitrogen will be out—others say that because of its low cost, it will stay.

Du Pont, now testing Freon C-318 (octafluorocyclobutane) is figuring on the FDA "go ahead" by late '58—cost will be about \$1/lb. But now nitrogen is the only FDA-approved propellant which gives a stream or flow pattern with foods. Nitrous oxide-carbon dioxide mixtures dispense foam-type foods: argon is too costly, pure carbon dioxide gives food an acidic taste, and pure nitrous oxide imparts a sweetish taste to foods. Units using the available fluorinated hydrocarbons and separated from food by a diaphragm (or enclosing them in a bag) have not proved successful either, are not considered as anything that will become practical.

Du Pont claims that in a year's shelf-life, Freon C-318 builds up a concentration of less than 1-ppm. flouride ion—one FDA requirement. Although Freon C-318 exhibits greater stability than other fluorinated hydrocarbons, it doesn't yet meet FDA's lethal dosage demands.

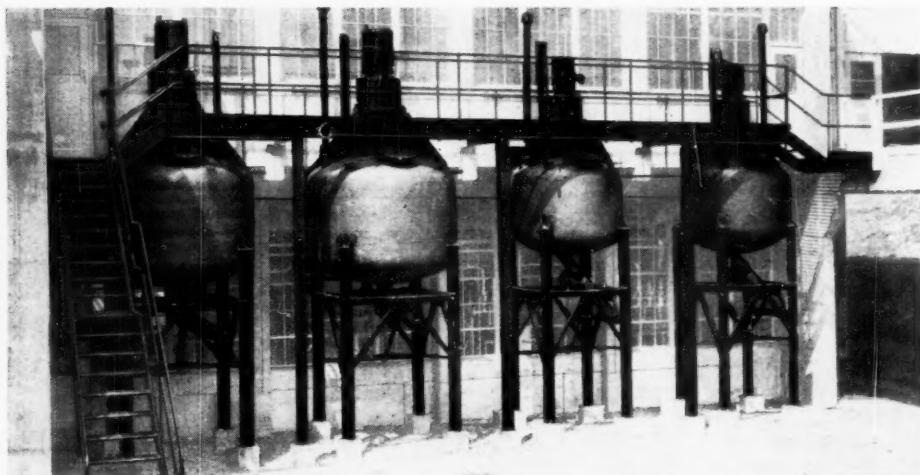
Just how big the impact of nitrogen packaging will be on the aerosol field—food and nonfood—is hard to say, just yet. Some fillers talk about the market growth—a threefold climb in five years. But there are other implications to its acceptance. One is that if nitrogen does catch on in the food field, it won't necessarily be an immediate bonanza for the contract fillers. The high cost of equipment, and of maintaining the standards of sanitation, the need for an assured high-volume market, and the space required may cause some firms to hesitate to try food packing. But others, including Aerosol Techniques and George Barr, are enthusiastic about food's potential in aerosols. Barr is already working on new plants for food packaging. If such firms have the success they're counting on, others will have to follow suit. They must be prepared to shell out plenty of cash for equipment and facilities if they hope to get in on the predicted boom.



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Merck Sharp & Dohme's survey* turned up these attitudes toward government medical research.

"Our company will have no part of a connection with the government on any score, even to the point of insisting that we will screen all our own compounds. Frankly, we are afraid of difficulties and confusion with regard to patent rights."

"We don't want the government in here, telling us what to do."

"Government should keep hands off research and patents."

"In Italy and Japan, there is no patent protection for drugs. As a result, they are just imitators. They don't do any inventing at all."

* "The New Era in Medical Research," a survey conducted by Douglas Williams Associates (New York), sponsored by Merck Sharp & Dohme.

No Words of Welcome for Federal Research

Opinions like those (*above*) might thwart the government's current bid for a bigger role in medical research. Result of a nationwide survey, sponsored as a public service by Merck Sharp & Dohme Research Laboratories and published last week, they reflect the current attitudes of the U.S. drug industry.*

Merck's purpose in making the survey, titled "The New Era in Medical Research," was to identify both the problems and the opportunities arising from the big jump in federal medical research spending since 1956. In June of that year, explains the survey, "Congress established a new national policy: that, henceforth, the United States will try to conquer disease 'through research, whatever the cost.'"

Surveyed were prominent medical researchers and other high-level personnel in pharmaceutical companies, government, foundations and universities. Sought was reaction to the fact that, in two years, Congress has more than doubled the funds for

the National Institutes of Health (from \$98 million to \$211 million). As a result, total '57 medical research expenditures—including \$127 million privately invested by the pharmaceutical industry, and sizable contributions by other groups—will top \$400 million. That's more money than has ever been available for the purpose in previous years.

But according to Merck President John Connor, the survey shows that "there are islands of poverty in this sea of plenty. Basic research is being neglected, medical education is in danger of being strangled, brain power is in short supply. These and other problems uncovered by this survey require immediate, thoughtful and concerted attention by leaders in government, the universities, foundations and the pharmaceutical industry."

Some of the biggest problems lie in the administration and effect of government research funds. There's sharp concern that NIH's program, since it is based on disease categories, will in some measure restrict freedom of researchers to explore areas as they see fit. Proponents of the cate-

gorical approach denied to interviewers that this limitation exists.

Suitable Role: The impact of burgeoning government research funds on medical research is also a controversial issue. Merck set about to explore the many sides of this topic with these questions: Is this a proper role for government? How did government get into medical research? How much can money accomplish?

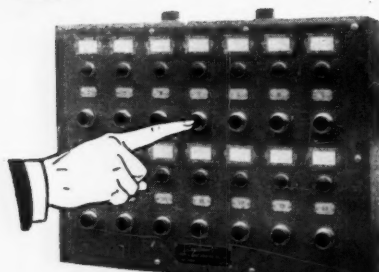
Advocates of government research told surveyors that the job of medical research is too big for individual firms, universities, etc.; that since health is a matter of public interest, medical research is a government responsibility; and that the government can and is willing to do some kinds of research (e.g., epidemiology) other institutions can't or won't handle.

Socialized Medicine: Many in industry, and a few in universities and nonprofit institutions, are vehemently opposed to large-scale financing of research by the federal government. "These men," the survey reports, "liken this development to socialization of medicine; they view the government activities in medical research

*Roughly half the survey report is made up of anonymous quotations from personal interviews—although a list of individuals interviewed is appended.

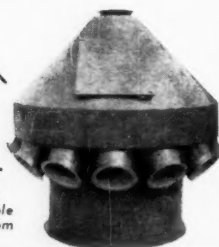
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RESEARCH

as another encroachment on free enterprise."

Resentment goes deepest among those who feel that industry has been doing a satisfactory job of medical research. Some also feel that the initiative of pharmaceutical companies may be stifled by federal funds. For example, one respondent thinks his company shouldn't spend a dollar on cancer research. He likened his company's chances of finding a suitable drug to playing in a poker game "against five guys, all of whom have \$20,000 in front of them. All you have are five \$1 bills. You don't stand a chance. Even if our company puts up \$200,000 for cancer (research), it's nothing. . . . The government has \$40 million to spend, so the chances are pretty slim we'll be able to do anything they won't be doing in this field."

Accept the Inevitable: Some opponents of the principle of government in research are accepting it as inevitable, think they should help see that such research is sound and well-conceived.

A proportion think that the increase in federal funds for research stems from political or vocational influences. They do this, says the survey, "either in the sense of a congressman or a senator forwarding the interests of an indubitably popular cause, thinking of his own re-election, or in the sense of people connected with national health organizations whose vocation it is to plead the cause of medical research."

And some think the money is being allotted for emotional reasons. An interviewer was told, "Large sums are not decided on logic, but by emotion. They play for the grandstand. I remember that one senator stated (privately, of course), 'More people are being kept alive by cancer research funds today than cancer is killing.'"

What Dollars Can Buy: The survey didn't turn up any general agreement on how much more medical research will be accomplished with the extra money. Those against the idea that money alone will expedite research argue: "You can buy more machines with more money, but machines can't do research."

Those in favor of high federal expenditures say mass production research is now possible. "In the old days, you used to work with a hun-

dred mice—now you work with 10,000 mice . . . ; an awful lot more ground is covered."

On handling the money itself: "Actually, wherever the government is involved, it is paying more for second-rate people than business and industry pays for first-raters."

But industry men are perhaps most vehement in their criticisms of the government's patent policy. The chief impression Merck's survey disclosed about patents is that industry men have done the most thinking about this particular problem. There's general confusion about what government patent and licensing policy is, or will be, in the future. The report makes it plain that, before venturing further into drug research, the government should clarify its hazy patent situation. It's made some progress in this direction for NIH's "crash" program for screening cancer chemicals (*CW*, Dec. 14, p. 58), by making a proposal (to let firms have patents, subject to certain restrictions) that hadn't been announced at the time of the Merck survey.

Drug men will demand elucidation of the patent problem and its satisfactory solution before they'll muster much additional enthusiasm for expanded government medical research.

EXPANSION

- Monsanto has launched an expansion of its Mound Laboratories (near Miamisburg, O.). Construction and new equipment will cost \$1 million. The electronics building will be converted into a laboratory for high-explosives development; a warehouse will be converted into a plastics formulation shop; and laboratory space will be added for separating rare-gas isotopes.

- Newly formed Rollins Research Industries Inc. (Toledo, O.) plans to construct a laboratory for product and process research in the chemical, ceramic, atomic, pharmaceutical and medical fields.

- Stanford University will add a new \$124,000 biophysical research lab, plans projects in cellular radiobiology, radiation chemistry, resonance studies of free radicals.

- Instruments for Industry Research (Cheltenham, Pa.) is a new firm specializing in low-cost automation of routine research procedures.

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PRODUCTION



Eureka's jelly-like anticorrosion coat is sprayed onto tank as . . .

CPI Dons New Antirust Garb

A corrosion-resistant coating that has proved valuable in marine applications is getting close study by chemical process firms this week. The material—called Fluid Film—was developed by Eureka Chemical Co. (San Francisco) for protection against salt-water corrosion, is also reputed to offer excellent resistance to chemical fumes.

Eureka describes Fluid Film as a petroleum-based gel* with a high flash point (350 F) and low inflammability. It is highly polar, adheres to metal surfaces quickly and tenaciously. In addition to excluding air, water, microorganisms and fumes from the surface, it contains ingredients that penetrate and sequester rust and scale. In fact, it can be applied directly to surfaces coated with rust. The rust is immediately attacked and, if desired, can subsequently be wiped away. And the coating's soft consistency gives it an advantage over hard-film coatings that tend to crack in some applications.

To date, the only verification of these claims is the result of over three years of punishing use in marine applications

(e.g., protecting metal pilings and offshore drilling rigs, lining ships' ballast tanks).

The durability of Fluid Film† in these applications is what caught the corrosion-conscious eye of the chemical industry, has won test trials for the film in chemical atmospheres within the past few months. These tests should spell out Fluid Film's future in the chemical industry within a year.

Distributed by Socony: Eureka concentrates on making and testing the coating material, has turned marketing over to others. Socony Mobil Oil Co. and its affiliates took over marine sales more than a year ago, just recently assigned its lubricating department to handling industrial inquiries. Standard Oil Co. of Kentucky is marketing the product in five Southeastern states not covered by Socony Mobil.

Socony's viewpoint is that Fluid Film is an interesting product with good notices in the marine field, helps round out the firm's existing line of coating materials. Company spokesmen point out that Socony has had no experience with Fluid Film in industrial applications, that it will just

have to wait until some feed-back information comes in from companies now testing it. Meanwhile, they quote Eureka on the properties of the coating.

High Initial Cost: There's no question that the coating is costly—28-32¢/lb. (at 7¼ lbs./gal., that's over \$2/gal.). But savings in surface-preparation, and coating-renewal costs may offset the high initial cost.

On exposed surfaces, the gel can be applied directly with conventional spray-gun equipment. Coatings on tank interiors can be applied by flotation: i.e., an ungelled form of the product is floated on water, reacts with it to form a gel and coat the inside of the vessel as the water level is raised.

The amount of Fluid Film needed for a specific application varies with the thickness of the existing rust coat. As little as 3 gal./100 sq. ft. are required for clean or lightly rusted metal, while at least 10 gal./sq. ft. are needed for surfaces with a ¼-in.-thick layer of rust. Areas subject to strenuous conditions such as continuous liquid washing action would obviously require a thicker coat.

The ability of the coating to maintain an effective thickness is one of the questions still to be answered by actual field tests. Especially severe conditions have led to a certain amount of wash-off, but Eureka says that even where washing has been purposely tried, a thin protective film remains. A definite limitation, though, is that petroleum solvents dissolve the coating. Eureka is working on this problem, plans to have a solvent-resistant version on the market this year. Eureka has already solved an appearance drawback, recently made Fluid Film commercially available in a number of colors.

But the film has one unavoidable drawback: it is a soft, greasy film, cannot be used on stairways, walks, ladders, handles or equipment where employees are likely to come in physical contact with it.

However, if the tests now under way prove to chemical firms that this is Fluid Film's most serious drawback, chances are Fluid Film will become a familiar coating material around the chemical plant in the not-too-distant future.

*Lanolin and Carbitol are among the many other ingredients. Patents are pending on the exact formulation.

†Coatings have stood up for more than three years without renewal.

Technology

Newsletter

CHEMICAL WEEK
January 4, 1958

A process for making sheet beryllium is the goal of a new undertaking by Brush Beryllium (Cleveland). It has just received a \$330,000 development contract for the job from the Air Materiel Command, Wright-Patterson Air Force Base in Ohio.

Brush will try to roll sheets of beryllium from pressed powder slabs. Sheets will be in thicknesses of 0.02, 0.04 and 0.06 in.; widths will be 12-18, 18-24 and 24-30 in.

The Air Force is interested in beryllium because of its light weight, strength and heat-resistance. It estimates that an all-beryllium fighter craft capable of traveling $2\frac{1}{2}$ times the speed of sound would weigh 16,000 lbs. less than a comparable model made of steel. The cost of a finished beryllium structure is placed at \$75-100/lb.; comparable cost of an aluminum structure is \$20-40/lb.

An all-acrylic resin suitable for low-pressure laminations will be test-marketed by Du Pont. A general-purpose resin, it will be available as a clear syrup, is destined primarily for use with reinforcing fibers. Du Pont reports it can be handled like other laminating resins, foresees its use in structural corrugated sheets, decorative flat sheets and complex shapes.

Du Pont is making the material now in an interim plant, will start distributing it early this year.

An important enzyme has been isolated by medical researchers at the University of California. It's the one that controls the production of cystine, the amino acid found in the structure of nearly all proteins, particularly those in hair and skin. The new enzyme is closely associated with pyridoxal phosphate, a modified form of the essential dietary factor and coenzyme, vitamin B₆.

Identification of the new compound should provide biological researchers with new material for a better understanding of some of the body's key chemical reactions.

Foods with built-in protection against tooth decay may be possible, say University of Wisconsin researchers. Fumito Taketa and Paul Phillips have investigated the decay-prevention properties of oat hulls. They previously had found a diet with 10% finely ground oat hulls that could cut decay in half. Their latest work indicates that 0.5% partly purified hull extracts can turn the trick.

The two biochemists are trying to find out which compounds are responsible for the results. They've zeroed in on 10 phenolic compounds and fatty acids, theorize that one or more of them protect the teeth through their bactericidal action.

Technology Newsletter

(Continued)

They feel that, once the material is identified, it could be manufactured at a modest cost, incorporated into food the way vitamins are. It might be possible, they say, to use the compound in items such as candy and chewing gum that are normally hard on the teeth.

Fremont Minerals Inc. will team solvent extraction with both acid and alkaline leaching (*CW*, Oct. 26, '57, p. 87) in its \$3.5-million, 500-tons/day uranium mill at Riverton, Wyo. The second mill to employ dual leaching circuits (Anaconda uses two at its Grants, N.M., mill), it will treat low-lime ores from the Gas Hills and Crooks Gap area by the acid process, high-lime ores mined in the Douglas and Pryor Mountain areas of Wyoming by the alkaline route. Fremont will start construction soon, expects to have the new mill in operation in about a year.

Now it's "cloud poisoning" to prevent snow. Geophysics Research Directorate, Air Force Cambridge Research Center (Bedford, Mass.), has found in laboratory tests and in preliminary atmosphere tests that monoethyl amine prevents snow crystals from growing, apparently by coating the seed crystals. The "poison" is floated into the cloud in gaseous form. In test cases, none of the treated clouds have "snowed." Some control clouds have, others have not.

Parke, Davis is introducing a new sulfa drug, said to effectively combat many Gram-negative and Gram-positive bacterial infections. A sulfonamide called Midicel, it is said to have an edge over the older sulfonamides, particularly in treatment of infections in the urinary tract. And since it is only moderately acetylated and slowly excreted by the kidneys, it is administered in smaller and less frequent dosages than some other sulfonamides.

Some new mathematical formulas to speed up molecular analysis have been polished up by three physicists at the Illinois Institute of Technology. After two years' work, they have come up with new formulas that give values to constants in several large molecules, eliminate cumbersome cut-and-try methods of determining thermodynamic data.

A new method of coextruding metals that have widely differing temperature characteristics is being readied for commercial use by Nuclear Metals, Inc. (Cambridge, Mass.). Details of the process can't be made public until NM's pending patents have issued, but it is believed to involve a multitemperature technique of working the dissimilar metals simultaneously.

Some new combinations that may be possible: base metals such as steel, copper, aluminum, beryllium or nuclear fuels with a variety of claddings, including zirconium, titanium, molybdenum, tantalum and other metals.

How does a growth company go about picking a new supplier?



Rexford S. Blazer, chairman of the board, Ashland Oil & Refining Company, Ashland, Kentucky.

"**T**AKING ON a new supplier at Ashland Oil is a very important decision," states Rexford Blazer, chairman of the board. "We were not only interested in immediate needs. We had to know our own long-range requirements. This pretty well dictated the size of suppliers. Then, we wanted to know how well equipped our suppliers would be to cope with the challenges that inevitably have to be met in continuing the growth factor in our business. What was their reputation for service? How about research? Were they development-minded? We investigated these very carefully in connection with Wyandotte, to the complete satisfaction of members of our team."

"**F**IRST, we established our requirements for our new brand Valvoline antifreeze," says Everett F. Wells, president. "For several years, we have felt that we should have a brand of antifreeze of our own to go with our famous Valvoline motor oil. Valvoline was the first motor oil in America. Valvoline has always been a top name brand. This dictated the highest quality ingredients for Valvoline antifreeze, and called for a careful



Everett F. Wells, president, Ashland Oil & Refining Company.

study on our part of all suppliers before selecting our sources. Our investigation proved that Wyandotte's glycol more than met these requirements. Others at Ashland carried on from here."



C. J. Farcasin, representative of Wyandotte Chemicals Corporation.

"**W**HEN I first learned that there was to be a Valvoline antifreeze, I knew it was a good prospect for Wyandotte quality," states C. J. (Jack) Farcasin, Wyandotte representative. "My main concern was: could I meet the challenges of a growth company introducing a new brand? Believe me, it was a team job—meetings with Ashland executives . . . contacts with our chemists and theirs . . . chemical data . . . tests . . . samples . . . days at our plant . . . complete handling and shipping data . . . then the long, anxious wait that shortens salesmen's lives. It was worth it, though. We're mighty proud to say that our ethylene glycol is being used in high-quality Valvoline antifreeze."

* * * *

Suggestion: Call in a Wyandotte representative and discuss your requirements with him. For the scope of our products, see listings below. Wyandotte Chemicals Corporation, Wyandotte, Michigan. Offices in principal cities.

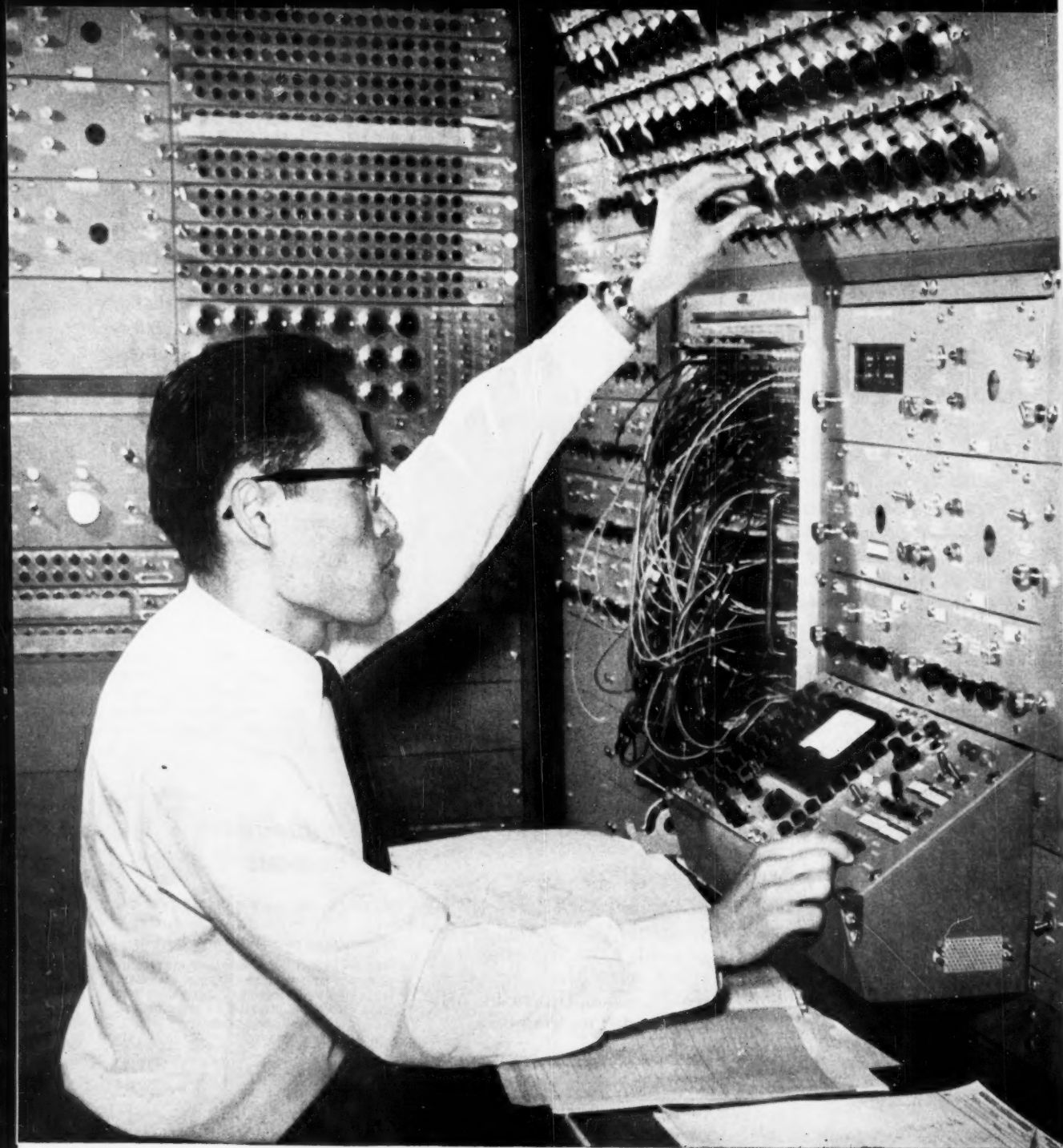
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ENGINEERING

Analog Computer Bypasses Pilot Plant

In a gleaming air-conditioned building at its new St. Louis headquarters, Monsanto recently embarked on a new approach to systems engineering that bypasses the pilot plant.

Key to this process engineering shortcut is a \$175,000, 116-amplifier PACE analog computer, specially modified to Monsanto's specifications by Electronic Associates, Inc., (Long Branch, N.J.)

Though the technique of analog simulation isn't new to the CPI (*CW*, April 16, '55, p. 80), Monsanto's installation is the first designed exclusively for analyzing chemical processes. However, several other chemical companies have conducted analog simulation studies on rented equipment (see p. 44), will likely follow Monsanto's lead.

Engineering Shift: Like the systems engineering concept, analog simulation is an evolutionary result of the growing complexity of chemical processing. Process engineers, for the most part, still adhere to the practice of designing equipment for steady-state conditions, compensating for extreme conditions by building in large safety factors. But the high cost of such plants, and other economic pressures, have forced engineers to seek out better methods.

Automation provides at least a partial solution of the problem of controlling a complicated system of integrated processing units. At the same time, however, it requires the engineer to know more about the reaction mechanics and the interrelation that exists between the integrated processing units.

To find the answers, chemical engineers now study processes as dynamic, rather than as steady-state systems. Systems engineering takes into account every factor that has an effect on the process, predicts how the processing conditions will change with one or more variables. But as the number of variables increases, the problem of studying combined effects on actual laboratory

or pilot-plant operations becomes a very arduous — and costly — task. That's where analog computers come into the picture.

Gets Fast Answers: The analog computer, says Monsanto, lends itself well to the type of differential equations used in studies of automatic control and chemical process dynamics. What's more, it's fast—records simultaneously all of the effects of fluctuations in a simulated operation. By comparison, a digital computer is slower, calculates the results of a change in a sequence of step-by-step calculations.

The digital system, however, is inherently more accurate, is used where precise values are needed, as they are in production scheduling computed on Monsanto's IBM 702 (*CW*, April 6, p. 44).

Engineering Teamwork: Though the theory and mathematical treatment of automatic control have been well developed in electrical and mechanical engineering, they're still relatively new to chemical engineers. Consequently, Monsanto had to set up special engineering teams to bridge the gap between the technologies of automatic control and chemical engineering.

The new analog computer installation is operated by the company's theory group in its recently formed systems section (part of the Research and Engineering Division's Engineering Dept.). Under the direction of Theodore Williams, theory group chief, each problem is handled by a team of two engineers—one is a chemical specialist; the other, an electronic engineer experienced in control systems and computer technology.

First Tasks: First work for the new computer teams, says Monsanto, is the investigation of a number of promising research developments that require systems engineering for proper plant design and improvement. Initial studies will include reaction kinetics, reactor design and control parameters.

By simulating process operation on

the computer, Monsanto eliminates the need for a large number of tedious laboratory experiments to determine optimum operating conditions. But far from making the research chemist obsolete, this systems approach requires an even greater amount of fundamental process information. Freed from the time-consuming task of calculating the numerous complex relationships, however, the researcher can devote more of his time to development of basic data from which the mathematical equations that describe the process can be derived.

Built-in Versatility: To obtain the versatility required for its chemical computations, Monsanto worked closely with Electronic Associates to modify a standard PACE computer. As Monsanto describes it, the final version has an extra-large capacity for generating nonlinear functions, allows for 24 separate continuous functions, has 36 relay amplifiers for discontinuous and intermittent or pulsed functions. Of the total 116 amplifiers, 72 are integrators, 44 are "summers." (Usual configuration for a computer of this size is 50 integrators, 66 summing amplifiers.)

The extra nonlinear capacity doubles the computer's ability to solve chemical problems. EA's basic PACE can simulate a five-tray fractionation column; the modified unit can duplicate the operation of a 10-tray column, including control equipment such as valves.

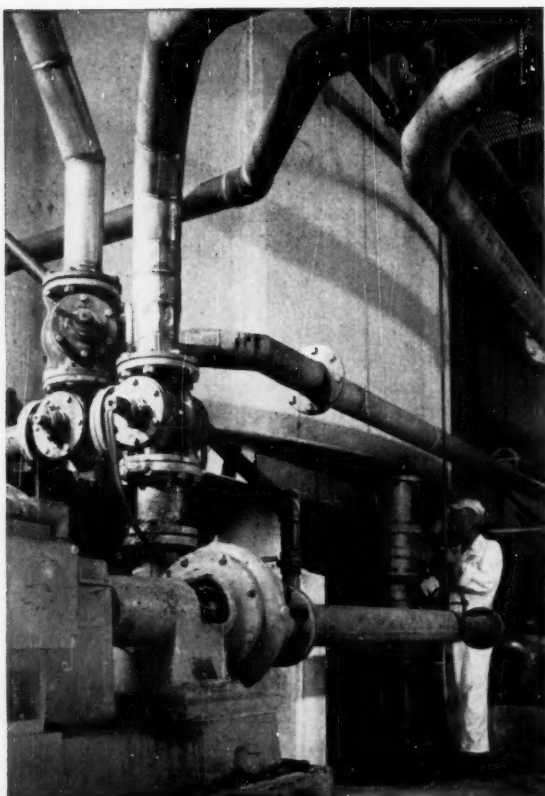
Three separate operating consoles enable the engineering teams to tackle small and medium-size problems as well as very large ones. For example, one console can handle a simple chemical reactor problem involving control of composition with four or five input components. Adding a second console permits temperature to be controlled as well. And if the number of ingredients is increased to 10, all three consoles are needed.

The system also has built-in expansion capability, can be doubled in size should the number or complexity of problems warrant the addition.

Economic Incentive: In addition to the intangible saving in research time and effort, analog simulation studies

Patchcords replace plumbing as Monsanto engineer runs computer-simulated process in a new electronic pilot plant.

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medium is wide because of its excellent solubility for a variety of reactants such as organic compounds, many inorganic salts and gaseous materials. DMF should especially be considered for substitution, addition, elimination and coupling reactions involving organic and inorganic halides. DMF also works well as a mild selective dehydrohalogenating agent.

We'll gladly send you additional information and examples of the power of DMF as a chemical reaction medium. Write for new product information bulletin on your letterhead. E. I. du Pont de Nemours & Co. (Inc.), Grasselli Chemicals Department, Rm. N-2533, Wilmington 98, Delaware.



BETTER THINGS FOR BETTER LIVING...THROUGH CHEMISTRY

ENGINEERING

will contribute to some very real cost reductions. By studying the possible effects of sudden and random fluctuations in process inputs, reactions conditions and other independent variables, Monsanto engineers expect to keep new plant investments as low as possible. And, as a result of closer control and more accurately designed equipment, they're looking for an additional payoff in higher yields of products with more uniform quality.

CPI Computer Center

In downtown New York this week, Mid-Century Instrumatic Corp. is readying two high-precision analog computers for installation in its new \$250,000 Manhattan Computer Center. Scheduled for completion around the first of March, the center is the first such facility specially designed to handle chemical process computations.

M-C's decision to cater to the computing needs of the chemical industry is indicative of its confidence in this potential market for analog computers. The company is currently selling a low-cost, desk-side computer (Model MC-400 selling for \$10,750) for process design computation, will shortly offer a larger Precision Master MC 5800 computer designed along the same lines as computer center units.

Package Offer: As an added inducement to prospective clients, M-C plans to issue 20 charter subscriber contracts that will enable them to use the center's services at reduced rental rates. The going rate for computer time, says M-C President Robert Stern, is about \$1/amplifier-hour. Under one of the special charter contracts, time will be charged at \$1/hour for the first 40 amplifier-hours, at 20¢/hour for the next 40 amplifier-hours. This arrangement enables a subscriber who fulfills the minimum 80-hour contract to obtain computer time for 60¢/hour.

It's difficult to estimate the exact amount of computer time required to solve a process design problem. The usual procedure is to first determine the upper and lower limits of operating conditions, then to narrow these down to the optimum range by cut-and-try adjustments. Though this procedure may require a large number of simulated pilot runs, says Stern, the computer can run off in minutes complex problems that would take many man-hours to solve by other methods.

The two units going into M-C's computer center provide a total of 136 amplifiers, will be able to simulate fairly complex processing systems. Amplifiers requirements of some typical calculations: 123 for the design of a 27-plate binary distillation column; 85 for dynamic simulation of an ammonia recovery control system with three streams entering the process; 60 for determining optimum temperatures in a four-stage reaction of a five-component mixture.

PROCESSES

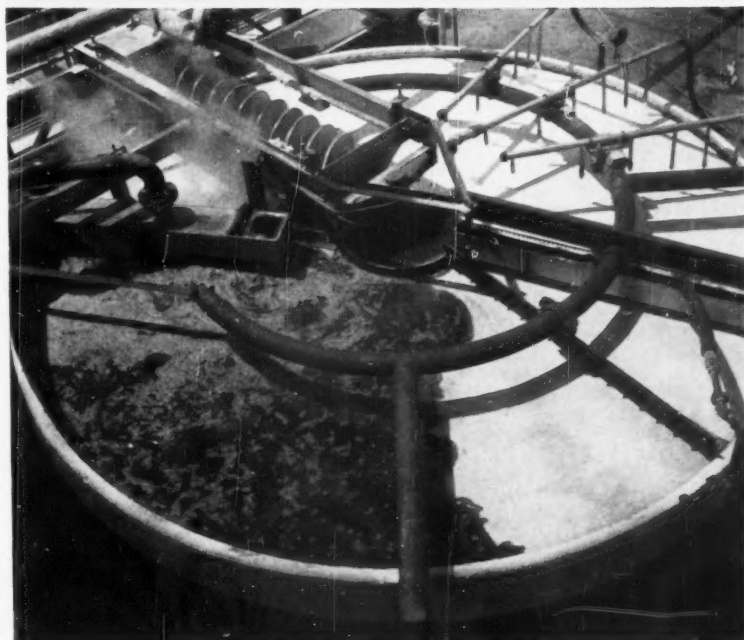
Aromatic Intermediates: Work is starting on the world's second installation using Scientific Design Co.'s (New York) liquid-phase, air-oxidation process for the production of terephthalic acid, dimethyl terephthalate and other aromatic intermediates. Mitsui Petrochemical Industries expects to have its 15-million-lbs./year plant onstream at Iwakuni, Japan, by early '59. First user of the process will be Standard Oil of Indiana's 60-million-lbs./year plant at Joliet, Ill. (*CW*, April 6, '57, p. 32), which is due in operation late this year.

Process Control: The Texas Co. will use a digital computer for fully automatic control of a petroleum refining process at its Port Arthur, Tex., refinery. The computer is a Ramo-Wooldridge RW-300, which can make 1,000 additions/second and has a 7,936-word memory. It is the first digital computer engineered specifically for automatic process control (*CW*, July 20, '57, p. 86). Texaco expects increased output, greater quality control and reduced operating costs as a result of the computer, but points out that the number of employees required to operate the unit will not be reduced.

Sugar Cane Wax: Commonwealth Scientific and Industrial Research Organization (Melbourne, Australia) describes a new solvent for refining sugar cane wax, conventionally extracted with acetone (*CW*, Dec. 22, '51, p. 23). Described in Australian Patent 17,102/56, the solvent consists of ethyl alcohol containing 15-30% (by weight) of a hydrocarbon (or hydrocarbon mixture) chosen from benzene, toluene, heptane, light petroleum (boiling from 60-120 C).

at **TRONA**

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This un-retouched photo dramatically illustrates the fundamental advantages of the Oliver Horizontal Filter. Note the even feed distribution and maximum area utilization . . . without using a filter tank or agitator. Note, too, the fast dewatering of feed and the two stages of counter-current washing in a single pass on the table.

Installed at American Potash and Chemical Corporation's giant Trona, California plant, this Oliver operates around the clock producing agricultural grade potash. One of five Horizontals of the over forty Oliver Filters of various types at Trona, the unit has a wash efficiency of about 90%.

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Market Newsletter

CHEMICAL WEEK
January 4, 1958

Another look at the U.S. sulfur industry's '57 record is in Freeport Sulphur's just-released annual review. Describing the year-end sulfur picture, Freeport's president, Langbourne Williams, notes that "the use of sulfur reflected the leveling off of business experienced by major consuming industries such as steel, fertilizer, chemicals, paper, pigments, and rayon." Here's how, according to the report, the '57 sulfur business compared with accomplishments in '56:

- U. S. consumption of sulfur in all forms was down 5% from the record 5.78 million tons consumed in '56. Exports were near the '56 high of 1.65 million tons.
- Total output of all U.S. sulfur in '57 was an estimated 6.9 million tons, compared with 7.82 million tons in '56. Frasch sulfur accounted for 5.5 million tons of the total, considerably less than the 6.42 million tons turned out in '56. Some 525,000 tons of elemental sulfur were recovered from gases; 425,000 tons were in the form of pyrites, 450,000 tons in other forms.
- As in past years, approximately 80% of the sulfur consumed in the U.S. was converted into sulfuric acid. The remainder was used in elemental form or in other compounds.

First large-scale commercial production of glacial acrylic acid in the U.S. will start early this year at B. F. Goodrich Chemical's new Calvert City, Ky., unit. Capacity of the plant amounts to "several million pounds/year."

The new plant will be integrated for production of acrylic resins as well as the acid. Among related chemicals to be made: a processing size for nylon (Good-rite TS-20); a foundry core-binder (Good-rite CB-35); additives for pharmaceutical, cosmetic and latex paint formulations.

Tabs on versene chelating agents are down as much as 20%. Price decreases on the ethylenediamine tetraacetic acid-based compounds, effective Jan. 1, were posted by Dow last week. Concurrently came word that versene production capacity has been increased at the firm's Freeport, Tex., plant, and still further capacity boosts are anticipated.

Largest percentage price cut is for versene 100—the most widely used of these materials—which brings cost in carloads down to 15½¢/lb. Prices of other versene products are shaved, include 5¢/lb. reductions on versene in acid powder, beads and flake form.

And there's a price cut on two isocyanuric acids. Knocked down 10¢/lb. as predicted (*CW*, Oct. 12, '57, p. 126) are Monsanto's trichloroisocyanuric and dichloroisocyanuric acids, bringing carload and truckload listings of each down to 65¢/lb. L.c.l. prices remain at 75¢/lb.

Market Newsletter

(Continued)

Major uses for the materials: active ingredients for household dry bleaches, commercial laundry bleaches, scouring powders, industrial sanitizing agents.

Chemstrand boosted some prices. A 10¢/lb. hike in prices of second-quality grades of nylon yarn puts 40-13 semidull yarn at \$1.91/lb. A 15¢ jump places a \$1.96/lb. tag on 40-13 dull yarn. Chemstrand's reason for increases: changes in production methods give a superior second-grade yarn, bring it more in line with first-grade.

U. S. rubber makers probably rang up record sales in '57, according to a just-issued preliminary report by the Rubber Manufacturers Assn. Says the association's president, Ross R. Ormsby, "It now appears fairly certain that in '57 the rubber manufacturing industry will surpass in dollar sales the record \$6.2 billion registered in '56."

U. S. consumption of new rubber in '57 reached an estimated 1,475,000 long tons, about 38,500 tons more than in '56. That would make '57 consumption the second-largest in the industry's history—topped only by the near 1.53 million l.t. used in '55. Synthetic rubber accounted for 934,000 l.t. of total '57 consumption; natural rubber, 541,000 tons. (About 295,000 l.t. of reclaimed rubber were also used in '57.)

Incidentally, U. S.-made synthetic rubber's share of the total new rubber market continues to increase steadily, amounted to 63% of the total in '57. Its share of the market was 60.87% in '56, 58.5% in '55.

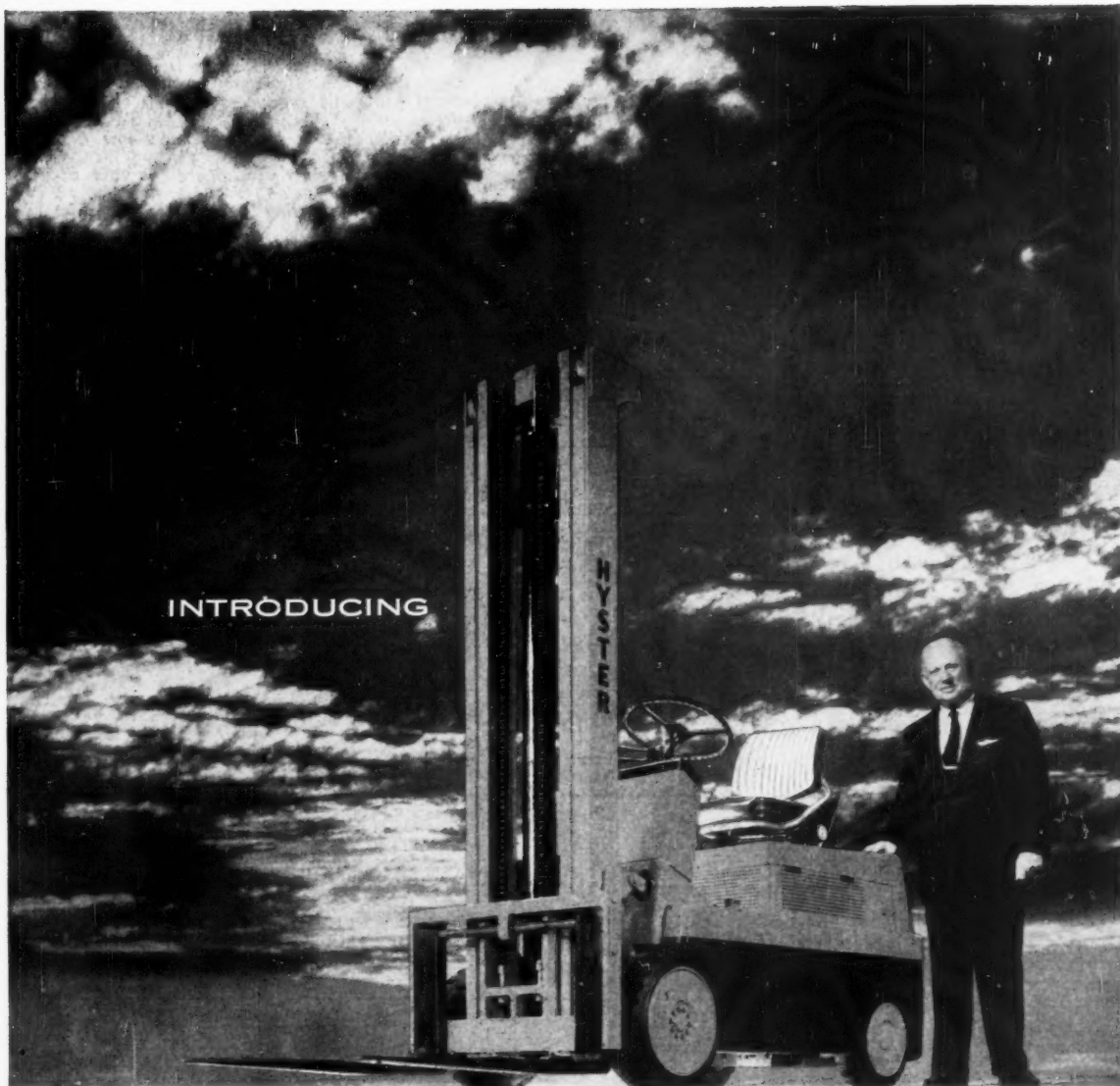
Political shifts in Indonesia could trim natural rubber output. "In such an event," says RMA's Ormsby, "U. S. synthetic (rubber) capacity would be an important factor in meeting foreign rubber requirements."

Use of synthetic rubber by non-Communist nations other than the U. S. has climbed to a new high, 23% of total new rubber usage. "Further substantial expansion" is foreseen in '58, and these foreign requirements will be met chiefly from U. S. production. U. S. rubber exports in '57 probably reached a new record of a near 200,000 l.t.—some 50,000 tons more than in '56.

SELECTED PRICE CHANGES—Week Ending December 30, 1957

	Change	New Price
UP		
Coconut oil, crude, tanks, Pacific Coast	\$0.0025	\$0.13875
Cottonseed oil, ref., tanks	0.00125	0.18125
Turpentine, gum, USDA, gal., 7.2 lbs.	0.0025	0.5275
DOWN		
Mercury, metal, flask, 76 lbs.	\$1.00	\$223.50

All prices per pound unless quantity is stated.



INTRODUCING

ERNEST G. SWIGERT, President, Hyster Company

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SPACE SAVER 40
4,000-lbs. Capacity



SPACE SAVER 50
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SPACE SAVER 60
6,000-lbs. Capacity



SPACE SAVER 70
7,000-lbs. Capacity



SPACE SAVER 80
8,000-lbs. Capacity



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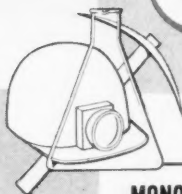


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	MONOHYDRATED COPPER SULFATE	35% Copper as metallic packaged in steel drums at no extra cost.
	COPPER CARBONATE	55% Copper as metallic. Light and dense grades.
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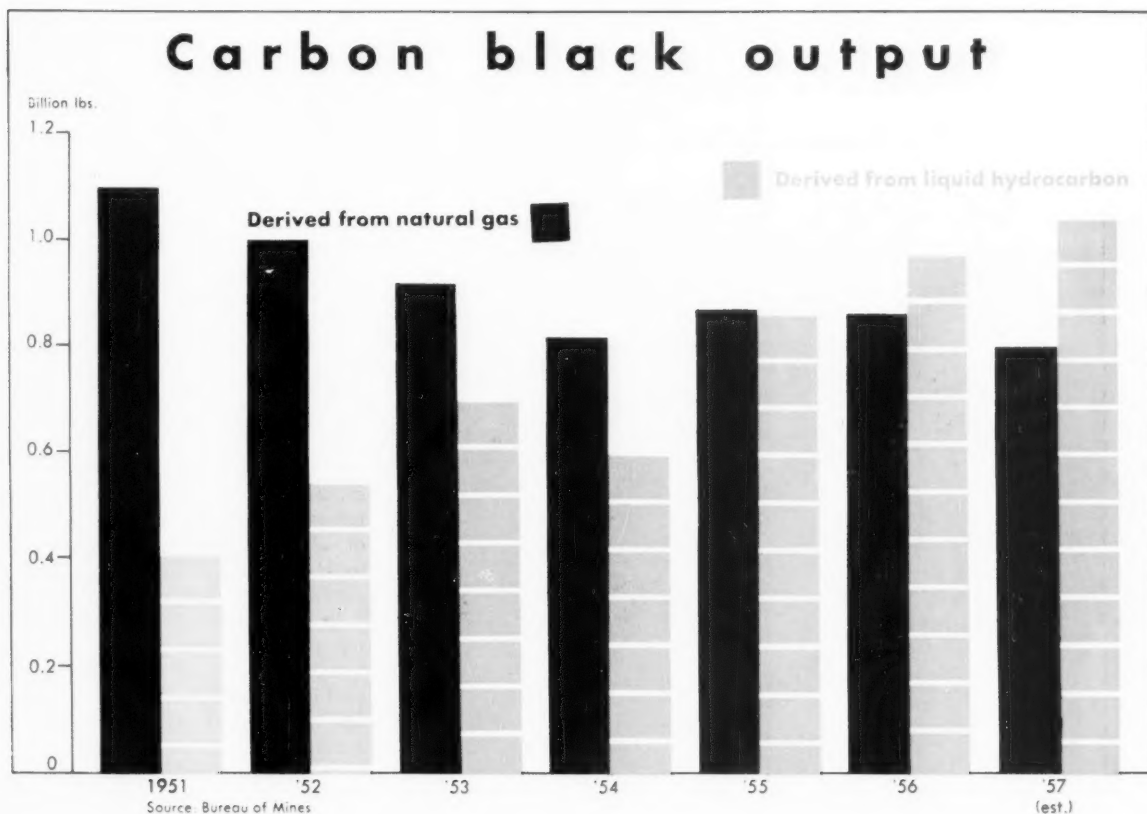
Samples, specifications and detailed information upon request.

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Carbon Black Switch—But No Slump in Use

U.S. producers of carbon black closed their books on '57 this week, settling for an output record of 1.84 billion lbs., almost the same record as in '56. And though there's little change in over-all carbon black output, there has been still more shifting in the source of carbon: for the first time, carbon production from liquid hydrocarbons moved past the billion pounds/year mark. It is a record gained at the expense of natural gas-derived black, whose output slumped to 800 million lbs.

Actually the turning point in the industry's over-all production pattern came in '56 when liquid hydrocarbon first moved ahead of natural gas as a prime source of carbon black. The lead of carbon black produced from liquid was even more pronounced in '57—production estimated at 1.04 billion lbs. represents a near 57% share of total U.S. output of the material.

It's a significant margin and will, no doubt, continue to widen in the years ahead.

Furnace vs. Contact: The surge in use of liquid hydrocarbon raw material, at the expense of gas, has meant a gradual shift in manufacturing methods from the older contact process to a now-favored furnace process. In '57, for example, furnace black accounted for more than 82% of total carbon black made in the U.S. At the same time, contact process carbon was whittled down to about 28% of the total output. The big shift from one process to the other has been accomplished in a relatively short time—since 1949, in fact, when the contact process still held a slight edge over the challenging furnace process.

There are sound economic reasons for the transition from gas to liquid raw material, and from contact to furnace process:

- Rising price of natural gas has favored use of oil.

- Furnace process seems cheaper to operate (aside from raw materials).

Gas Price Rise: The cost disadvantage of gas is plain in a U.S. Bureau of Mines' report that shows the average cost of gas used to make carbon black to be some 10 times higher in '56 than in '41. This cost upswing of natural gas is probably the major factor in the scuttling of the near monopoly formerly held by the contact process. Reason: the contact process gives low yields, is dependent on the use of an inexpensive raw material. Hence, the advent and subsequent gains of the furnace process have more or less paralleled the increasing costs of natural gas.

Petroleum Cut-in: Working hand-in-hand with rising gas costs and an increasing preference for the furnace method was the widening acceptance

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MARKETS

of liquid petroleum-derived carbon black by consumers. Rubber manufacturers in particular found that liquid-derived blacks were better suited for use not only with the increasingly popular synthetic rubber but also with natural rubber.

Largely because of the rubber industry's preference for liquid-derived black, output of this material, say industry spokesmen, will represent 85% of the total U.S. carbon black production by '75.

Although some market followers envision a slight setback of total carbon black output in '58 (to some 1.75 billion lbs.), the long-range trend is definitely upward. One forecast: total domestic carbon black consumption will hit some 2.5 billion lbs. by '75.

Tire Tie-in: Chief sales prop for carbon black is, of course, the rubber industry, which now takes about 94% of all U.S.-consumed blacks. And backbone of the rubber industry is tire production.

In '57, U.S. rubber consumption was pegged at some 1.5 million tons, a slight gain over the 1.44 million tons used in '56 but still some 6% less than the record 1.53-million-tons record consumption in '55. These fluctuations were, of course, reflected by sales of carbon black to rubber manufacturers. Estimated sales of black to the rubber industry in recent years: 1.29 billion lbs. in '55, 1.24 billion in '56, and 1.3 billion in '57.

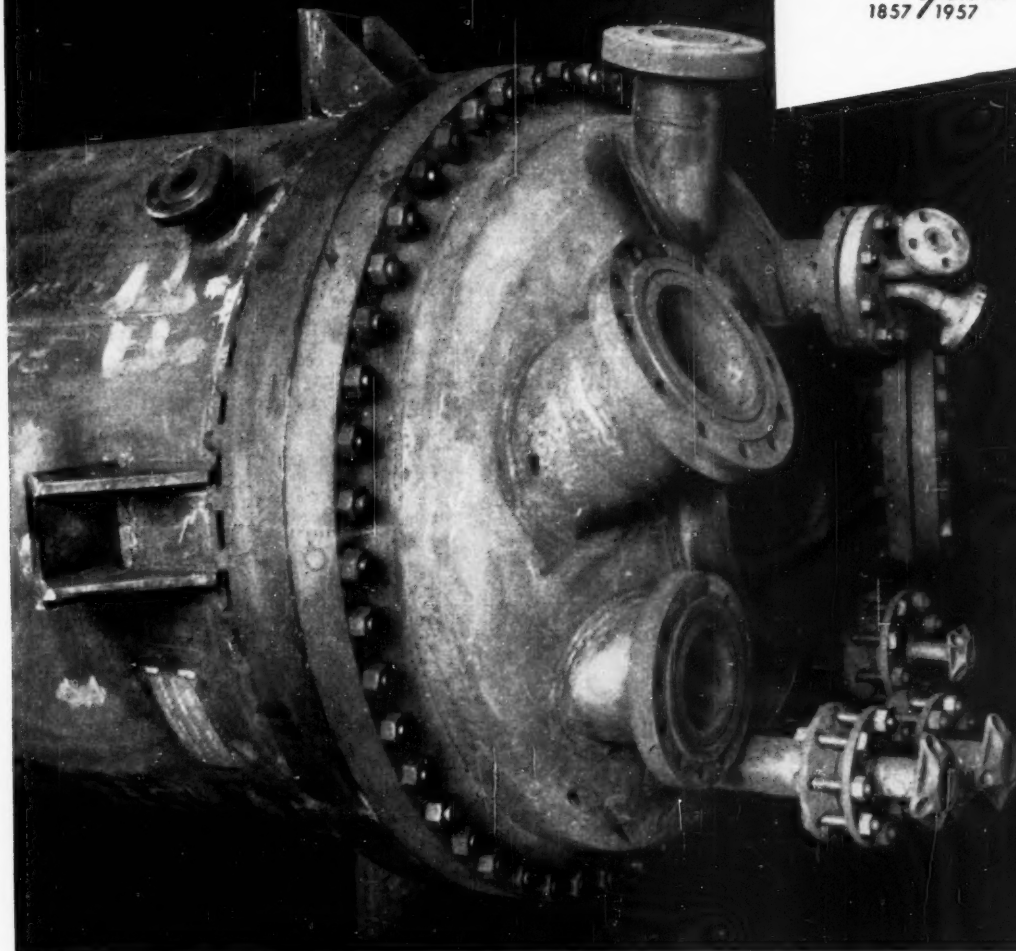
Demand for passenger tires, especially for replacement, is increasing steadily. Sales were 4% higher in '57 than in '56—some 90 million units, compared with 85 million units. As implied, the replacement market for passenger tires was the bulwark of '57 tire sales, amounted to an estimated 56.5 million units (topping the record 54.7 million units in '46).

Replacement Total Sales (million units)

1946	54.7	66.4
'54	47.1	77.7
'56	53.3	85.0
'57 est.	56.5	90.0

U.S. tire manufacturers point out that the '55 auto production boom gave to '57's replacement tire sales a welcome shot in the arm. Meanwhile, original equipment tire sales for '57 checked in at an estimated 33 million units—a healthy jump over '56's 30.8 million units, but nowhere near the 42.5-million-unit peak hit in '55.

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MARKETS

U.S. Carbon Black Production

	Contact process (billion pounds)	Furnace process
1951	0.65	1.03
'52	0.56	1.04
'53	0.45	1.16
'54	0.38	1.03
'55	0.36	1.38
'56	0.36	1.48
'57 (est.)	0.33	1.51

Tires for export held steadily in '57, hovered at 0.9 million units.

Some tire manufacturers are now predicting that tire sales in '58 will equal those in '57 and that replacement tires sales will nudge 59 million units.

However, one major carbon black manufacturer is much less optimistic, says '58 tire sales will be somewhat less than in '57 and that some enthusiastic forecasters will have to "eat their words" when the final score is in.

Inks Help Sales: Ink manufacturers have remained second-largest buyers of carbon blacks, soak up about 4% of total annual domestic sales. Last year ('57), sales of carbon blacks to ink makers was some 45 million lbs., somewhat higher than '56's 42 million lbs. but still not topping '55's peak of over 55 million lbs. Nonetheless, carbon black makers still hope to top the '55 record sales to ink manufacturers, who look for a bonanza year in '59.

Paint Pickup: Sales of blacks to paint producers are estimated to have been somewhat higher in '57 than in '56, about 13.5 million lbs. vs. 13.2 million lbs. This resurging outlet now looks a lot brighter than it did in '54, when use of carbon blacks by paint-makers shrank to a worrisome low of 7.7 million lbs.

It's apparent that carbon black's future, although slightly dependent on the inks and paints industries, is most completely tied to the rubber industry. As long as the rubber tire producers remain confident, the worries of carbon black manufacturers will be largely those arising from the switch in manufacturing processes.

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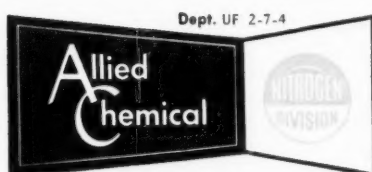
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Piercing Logic Barriers to Increased Sales

Resolving the difficulties in blending human relations and logic into an effective sales approach isn't an easy task. But that is the goal of a new four-week training course now being launched at Union Carbide Chemicals.

Complementing its regular two-year sales training program, the course breaks with conventional practice by:

- (1) Providing a systematic method of analyzing sales problems.
- (2) Emphasizing human relations to produce maximum persuasiveness.
- (3) Including credit, purchasing, development and advertising personnel as well as trainees and salesmen.
- (4) Producing tangible results quickly.

Results have been so gratifying,

says instructor John Galaba, that on the basis of two pilot groups Carbide is giving the high-cost course to every member of the sales and credit force—and some others, as well.

Galaba stresses to his students the thesis that "buyers buy to benefit." If the salesman can communicate (by skillful use of human relations) the "right" benefits to the buyer, a sale is almost certain to result.

The course utilizes a "question system" of finding the benefits most important to an individual buyer. And the course also presents a system of logically searching for and listing all benefits a buyer might obtain from a specific product. Students, moreover, get a written method of analyzing sales problems. The whole loaf is leavened by human relations.

In the sales training pitch, Galaba explains, "we put the accent on human relations rather than the hard sell. There must be a thousand manuals telling salesmen to be alert, to be enthusiastic, to be aggressive. Our sessions spell out the when, why and how of such techniques."

Class Makeup: Experience with the pilot groups indicates that the ideal class should include, besides the trainees, representatives of the credit, purchasing and development departments and some experienced field salesmen.

Credit men use the schooling to obtain a more tactful approach to customer problems. Today, in particular, credit departments play a critical role in sales activities. That's because more and more customers are request-

ing extra time to pay bills (*CW*, April 6, p. 75). The credit man's attitude—and even the approach of the salesman—to the credit request often determines who gets the order.

Experienced salesmen season discussions with real-life selling posters. And they benefit by learning to analyze situations they've been unable to resolve.

The purchasing agent attends, declares Galaba, because sales trainees "have never dealt with one. Yet all sales training is basically aimed at the purchasing agent. Having one on hand helps familiarize class members with purchasing problems and buyer-reaction to various sales approaches." Such cross-fertilization benefits, he adds, apply to all taking the training.

Format: Because the course accents free discussion, sessions are held about a round table rather than in a regular classroom. Galaba acts more as a moderator than an instructor.

In the early phases, training stresses the importance of emotion in the over-all sales presentation. Galaba estimates that fully 80% of human action is influenced by emotion. That means salesmen must attract favorable attention from a buyer before presenting the reasons for buying a given product. Trainees learn how to get that attention through such varied means as contributing trade news, chatting briefly about the buyer's hobbies. It's one way of using human relations to set a climate for persuasiveness.

Students are naturally skeptical; hence, Galaba insists that the group take nothing for granted. He suggests that they try the persuasive methods on families and friends. Result: morning sessions sparked by results of attempts to talk the wife out of a new hat, for example.

Specific Problems: Later, emphasis shifts from over-all sales presentations to specific objections that break down a smooth sales pitch. Students are called to the blackboard, asked to chart presentations they would use to counter a specific buyer objection. It might be price, delivery, or perhaps a previous-friendship sales obstacle. If there's a weakness in the outlined solution, another trainee, in the role of buyer, punctures the soft spot.

Here, Galaba underscores the im-

portance of telling a balky buyer what the product will do for his company rather than harping on the nature of the product itself. And it's here that the use of logic (to deduce and present benefits) plays a key role.

Another part of the course—"problem solving"—is handled in much the same way as are objections. The problem-solving phase includes all the basic problems of human relations—everyday situations in which the salesman must persuade someone to do what he suggests.

Carbide gives the course to new sales trainees at the midpoint of their training program, the end of the first year. By then, the neophyte salesman has been thoroughly grounded in UC's product technology, sales, traffic and credit operations and laboratory and production facilities. At the midpoint, a one-year stint as an "inside" salesman in a field office lies ahead.

UC considers the midpoint the ideal time for the course; it comes just when the student has acquired the necessary background and just before he will place into practice his training in human relations and sales logic.

Quick Results: Although only a few months have elapsed since the first pilot groups finished the program, UC is getting gratifying results. Galaba estimates that 25% of the graduates showed immediate and "dramatic" improvement. Another 50% "improved noticeably." The remaining 25% have yet to demonstrate a significant change for the better.

Managers and department heads back Galaba's estimate, report that men acquire improved attitudes making them more successful and valuable to the company. And in several instances, the training has proved instrumental in advancement.

Some side benefits are also realized; UC has some indication that trainees find the system helpful in handling personal problems. (Some sales authorities consider a salesman's home life the most important single factor in his success.)

Trainees entering the field this year will face the toughest selling conditions in recent years. Carbide officials are counting on the course for the "extra" push—the know-how needed to crack the human-relations and logic roadblocks to sales.

Metal-Clad Paper Bows

Vacuum-metalized packaging paper will get off to a fast start this year. Almost simultaneously, Continental Can and National Research Corp. have just disclosed commercialization of processes long under development.

Not to be outdone, Minnesota Mining & Mfg. entered into the sales fracas with an aluminum-clad (by vacuum deposition) version of its heat-sealable polyester film, Scotchpak. Processors have offered an aluminum-clad, nonheat-sealable Mylar film for some time. A heat-sealable Mylar is in the works.

But definitely marketing commercial quantities of their products are Continental's Shellmar-Betner Division and 3M. In early '58, they'll be joined by NRC Vaculite Corp., a subsidiary formed by National Research and, for the last two weeks, half-owned by Champion Paper.

Markets: Both Vaculite and Continental will aim at decorative-packaging and building-insulation markets. Best packaging prospects are household chemicals, drugs and cosmetics. NRC forecasts an over-all potential market to be "in excess of \$200 million."

Undoubtedly, the papers will undercut aluminum foil, foil laminates and other metal-covered products in such uses. The papers are claimed to offer most of the appearance characteristics of those competitive products but at a lower cost. Another advantage, superior machine-handling, is claimed for vacuumized paper. Both papers are printable.

Although more expensive than the papers, 3M's metal-clad polyester is touted to have advantages that make its use economical. These include low water vapor and gas permeability, make it seem particularly well suited for cosmetic packaging.

What Next? The metal-coated papers are just the beginning of products that are now possible. Plainly on the horizon are vacuum-deposited aluminum coats for multiwalls and folding cartons. Substantial research work must be done first.

Dow's Dobeckmun Division is researching metalized paper on a limited scale. And if a market develops, Dobeckmun believes it could metalize Dow's new fiber, Zefran.

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Ceased operations November.
Including glass-lined tanks, diatomaceous
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B & W boilers, hundreds of Lastiglas-lined
tanks; air compressors; generators; copper
kettles and cookers; coolers, APV Paraflow
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This plant reopened two years ago at a rehabilitation cost of \$250,000.

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Sharpsburg Plant of Fort Pitt Brewery, annual cap. 600,000 bbls. closed in November; available for immediate delivery is this complete plant, including:
16 A. O. Smith one-piece glass-lined tanks totaling 150,000 gals., stainless coolers, cookers and kettles, Enzinger stainless diatomaceous earth filter with open feeder; 23 stainless riveted leaves; CO2 storage tanks for 250 psi; copper double-pipe coolers; refrigeration compressors and individual room coolers; 49 rectangular glass-lined tanks totaling 650,000 gals.; 85 other tanks from 1500 gal. to 12,000 gal.; 17 vertical wood tanks, 10'8" x 11'8"; G.E. AC generator; I-R horizontal air compressor; bottle washers, rinsers, labelers, fillers, packers; 7500 ft. practically new case conveyor with AC motor drives; over \$3,550,000 worth of practically new equipment for you.

Write for complete listing to:
**FORT PITT BREWERY,
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AT&M 48" dia. Suspended Centrifugal, Stainless Steel contact parts; perforated basket; vapor tight; rebuilt. Perry, 1415 N. 6th St., Phila. 22, Pa.

Rotary Vacuum Dryer, 42" dia. x 15' long; ASME 50# jkt. Perry, 1415 N. 6th St., Phila., Pa.

Allis Chalmers 6' dia. x 50' long Rotary Dryer 77/16" shell. Perry, 1415 N. 6th St. Phila. Pa.

100'—9" S.S. Screw Conveyor used—excellent
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Tank Trailers for Chemicals Stainless Steel—
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Wanted

Wanted to purchase 55 gallon stainless drums
in good condition—used. W-6255, Chemical Week.

Wanted—Beckman Spectrophotometer, Model DU, used. Please describe condition and indicate price desired. Write Hardwood Chemical Co., P.O. Box 163, Buffalo 5, New York.

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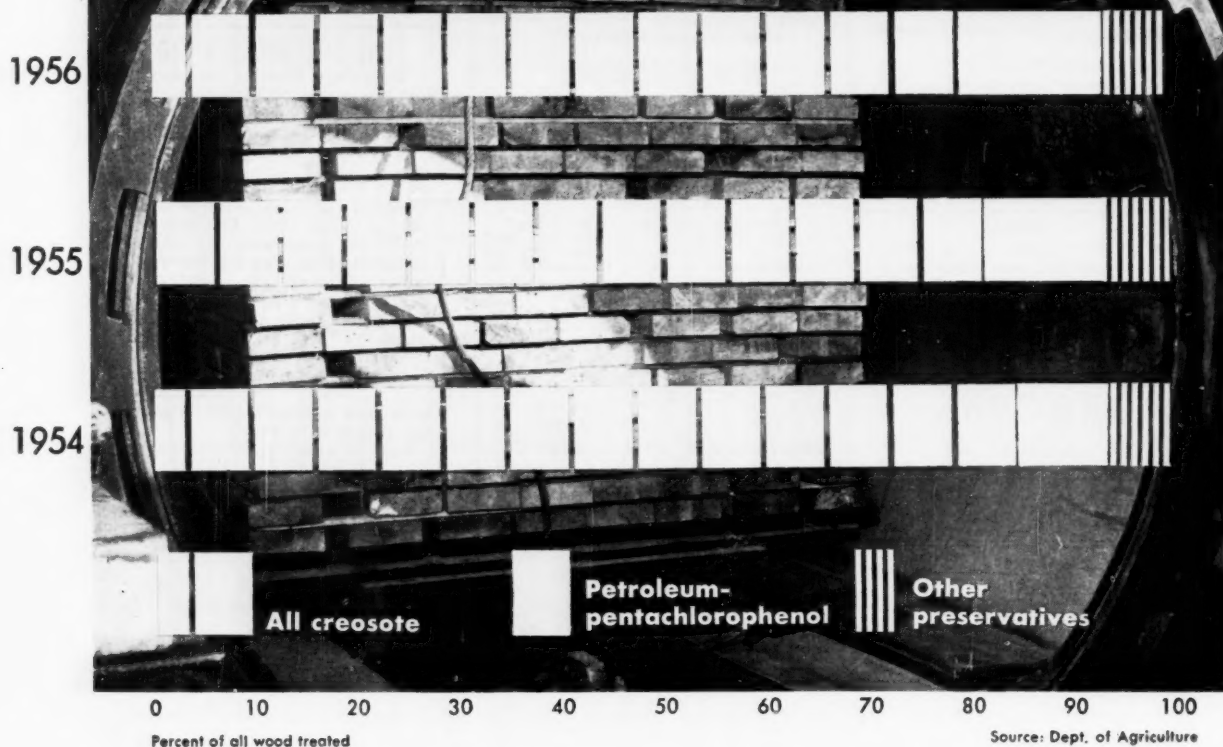
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CHARTING

BUSINESS

January 4, 1958

Wood Preservative Consumption



Creosote: It's Still the Prime Preservative

Volume of wood treated by various preservatives showed a 4% gain in '56 over '55 (some 258 million cu. ft. vs. 248 million cu. ft.), according to latest government figures.

Total sales of creosote wood-savers—still the predominant materials, but steadily losing ground to pentachlorophenol—were about 154.3 million gal. in '56. That's a slight increase over '55's sales of 150.6 million gal. The '56 use of creosote and creosote solutions for wood treatment took about 79% of the total

market. In '55, it accounted for 82%; in '54, 85%.

Pentachlorophenol gained as a wood preservative. The '56 consumption was some 25% over the '55 usage, some 13.2 million lbs. vs. 10.5 million lbs. In '56, the pentachlorophenol treatments took 14% of the market; in '55 it was 11%, while in '54 it was about 9%.

All other materials—e.g., chromated zinc chloride, Tanalith Celcure—held their combined 7% wedge of the market in '56.



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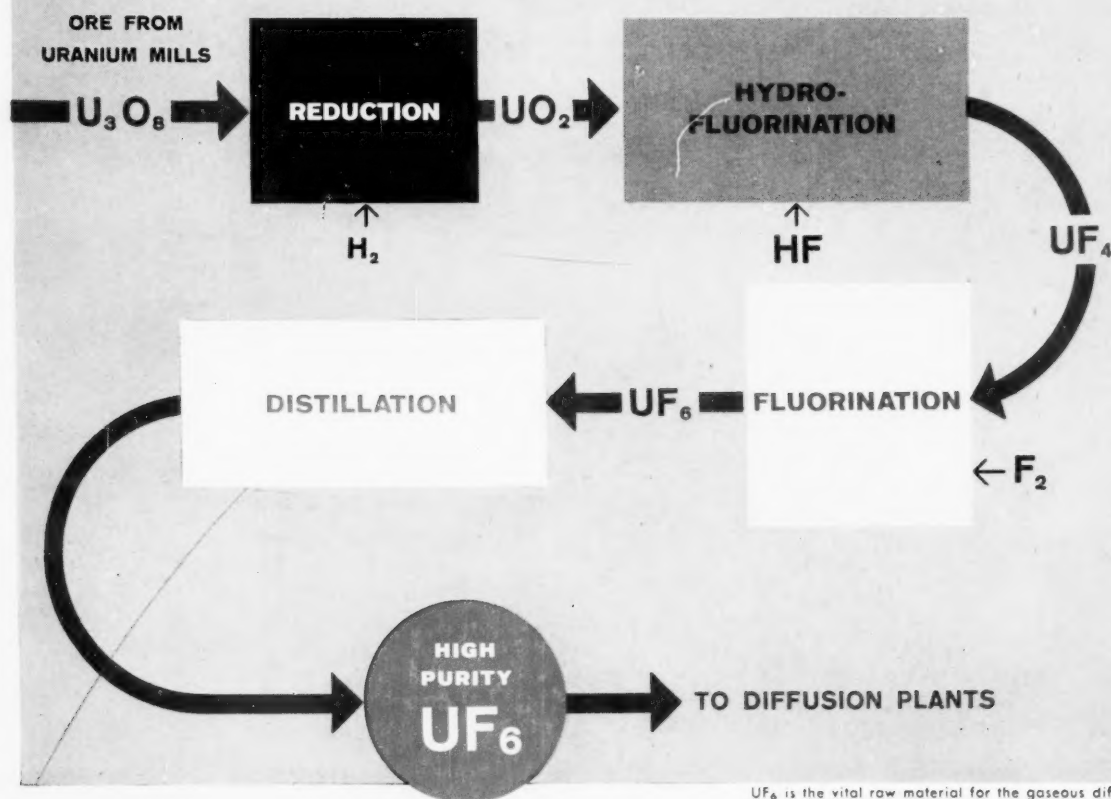
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Sodium Sulfite • Pentaerythritol • Pentachlorophenol • Sulfuric Acid • Maleic Anhydride • Sebacic Acid

Chemical Processing for Atomic Energy



UF_6 is the vital raw material for the gaseous diffusion process, which separates UF_6 into $U^{235}F_6$ and $U^{238}F_6$.

NEW PROCESS FOR URANIUM HEXAFLUORIDE

wins General Chemical a share in 1957 Chemical Engineering Award



processes in extractive metallurgy of the Atomic Age metals."

General Chemical's significant contribution is the research and development of a new process for producing

One of the highest honors in the chemical industry—The Chemical Engineering Achievement Award—was recently presented to General Chemical and others for "pioneering applications of chemical engineering principles and

refined uranium hexafluoride for the Atomic Energy Commission. General will be the first company to refine uranium oxide compounds for the AEC in privately owned and operated facilities. Its new UF_6 plant, now under construction at Metropolis, Illinois, is scheduled to go on stream early in 1959.

General's new process for UF_6 embodies advances in fluorine technology that stem directly from its broad experience as the country's foremost producer of elemental fluorine, hydrofluoric acid, halogen and other fluorides . . . One more example of General Chemical serving the nation and industry—through leadership in fluorine chemistry.

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